TEXTILES PAPER LEATHER

AMERICAN DYESTUFF REPORTER

Including the Proceedings of the
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XII JULY 16, 1923 NUMBER 15

THE NEWPORT COLORS

For Quality and Money Value

Newport Sulphur Sky Blue B
and
Newport Sulphur Blue B X N
Superior Qualities
Low Priced

NEWPORT
REG U.S. PAT OFF
"COAL TO DYESTUFF"

Newport Chemical Works, Inc.
Passaic, New Jersey

BRANCH OFFICES: Boston, Mass.; Providence, R. I.; Philadelphia, Pa.; Greensboro, N. C.; Chicago, Ill.; Schenectady, N. Y.; Charlotte, N. C.; Springfield, Mass.

WAREHOUSES: Boston, Mass.; Chicago, Ill.; Greensboro, N. C.; Philadelphia, Pa.

A Chrome Black for Every Requirement

PONTACHROME BLACK T—finds a large use where resistance to severe potting is essential. Its excellent general fastness qualities make it a desirable color for the production of jet blacks on material which will be subjected to severe wear.

PONTACHROME BLACK A—possesses all the desirable qualities of the "T" brand, and is of a bluer shade, which, together with the fact that it does not gelatinize when used in high concentrations, recommends its use for Vigoureaux printing.

PONTACHROME BLACK F—is one of the few chrome blacks not affected to any appreciable extent when dyed in metal machines. Due to its unusual covering power it is also possible to obtain full, deep shades of black at a low cost and with no sacrifice of fastness qualities.

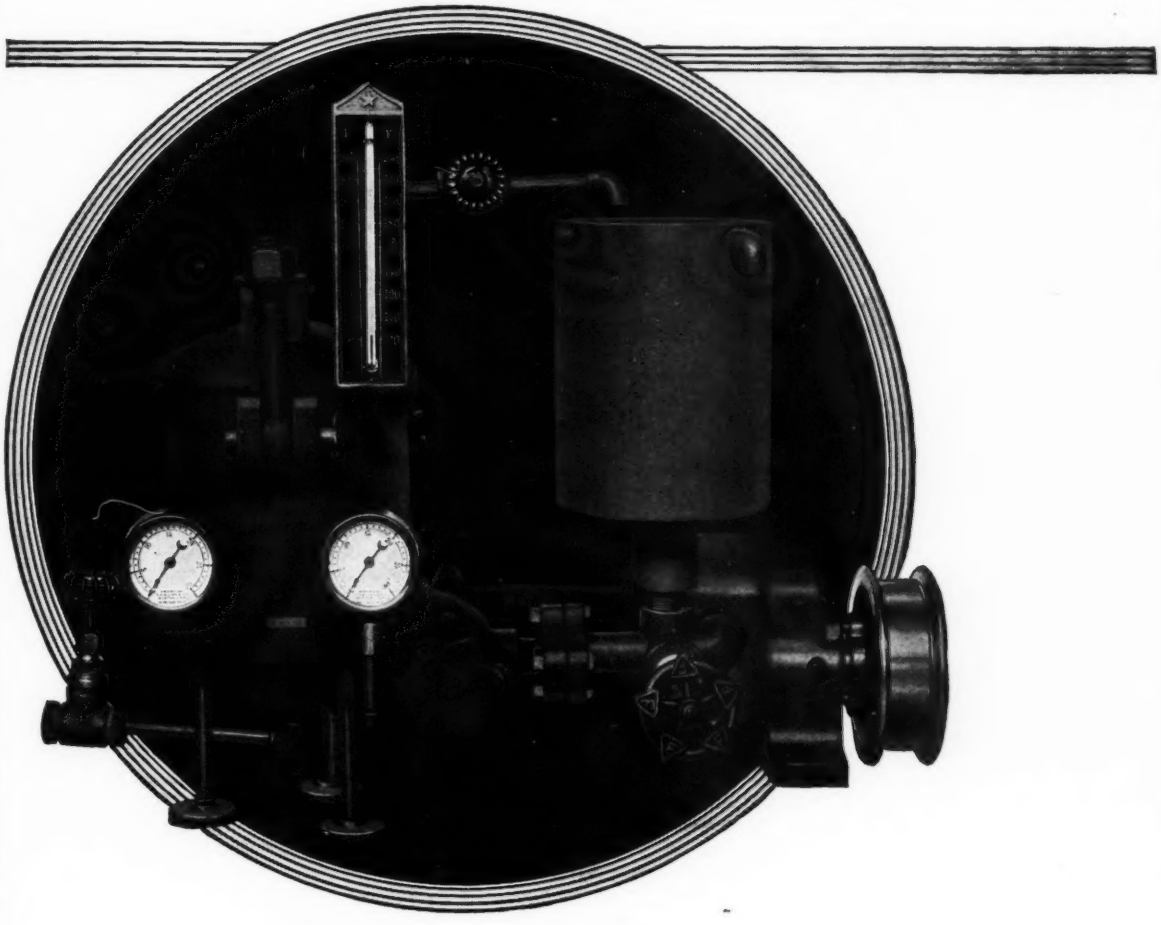
PONTACHROME BLUE BLACK R CONCENTRATED—is in large demand, not only for the production of blacks of good fastness to light, washing and fulling, but as a base in the dyeing of navy blues, for men's wear goods. It is also used to a considerable extent for Vigoureaux printing.

E. I. DU PONT DE NEMOURS & CO., Inc.

WILMINGTON, DELAWARE

STANDARD DU PONT DYESTUFFS UNIFORM

American Dyestuff Reporter, Vol. XII, No. 15. July 16, 1923. Published biweekly by Howes Publishing Co., Woolworth Building, New York, N. Y. Domestic subscription, $5.00; Canadian, $5.50; foreign, $6.00. Entered as second-class matter Nov. 6, 1919, at the New York, N. Y., Post-office, under the Act of March 3, 1879. Copyrighted, 1922, by Howes Publishing Co.



A 1 lb. Sample Dyeing Machine

THERE are so many Franklin Dyeing Machines now in use that dyestuff manufacturers are constantly called on to furnish dyestuffs suitable for Franklin Machine Dyeing. It was for experimental purposes along this line that the Franklin One Pound Machine was manufactured. This machine is very convenient and economical for developing new shades or testing new dyestuffs.

Ordinary laboratory cup dyeing has not proved reliable in our experience as a means of determining whether a certain dyestuff can be used in an iron or a bronze dyeing machine. Here again the Franklin One Pound Machine is very valuable, as a test conducted in this machine will give results that are *absolutely* reliable.

This is true not only because the proportion of metal in the Franklin Sample Machine is the same as in the larger machines, but also because the amount of liquor in proportion to the amount of yarn is the same. Any dyeing made in the Sample Machine can be duplicated in the larger Franklin Machines.

Dye houses, as well as dyestuff manufacturers, will find the Franklin Sample Dyeing Machine very useful and economical for experimental purposes.

This machine is identical in design and principle of operation with the larger Franklin Machines. It will dye two 3″ packages or one 6″ package of yarn per batch; requires ¼ H.P. to operate the pump and ⅛″ steam supply with a pressure of at least 25 lbs. Equipment includes all necessary valves, pressure gauges and thermometer.

The machine is very compact, occupying floor space 16″ x 24″, and can be set on an ordinary laboratory bench or table.

As we wish to have as wide a distribution of this machine as possible, we are offering it at a very reasonable price, and feel sure that no dye house operating Franklin Machines can afford to be without one. Price on application.

FRANKLIN PROCESS CO.

Philadelphia **PROVIDENCE** Manchester, Eng.

New York Office, 72 Leonard Street

SOUTHERN FRANKLIN PROCESS CO.
Greenville, S. C.

DH P&B

E. de Haën DH Hannover

Antimony Salts—65%
Barium Sulfocyanide—Crystals
Chromium Fluoride—Crystals
Potassium Chromate—Neutral Yellow

P&B

Austrian Blood Albumen
Glues and Gelatines

Sole Agents for the U. S. A.

Pfaltz & Bauer, Inc.
300 PEARL STREET-NEW YORK

P&B DH

Another excellent Althouse product is

Benzanol Brown G S R

A direct dyeing brown of high concentration and rich orange tone.

Its Good Fastness to Washing makes it a valuable color for Hosiery, Weaving Yarns and Raw Stock.

Its ready Dischargeability to a Perfect White makes it useful to Cotton Printers.

Like all Althouse Colors, it Dyes Evenly, whether a Tint or a Full Shade.

Like other Althouse Colors, it has no Schultz number, no pre-war prototype. It is an American product for American consumers.

ALTHOUSE CHEMICAL CO.
READING, PA.

The L. B. Fortner Co.
102 Pearl St., Boston, Mass.
Sole Selling Agents for New England.

Built on the experience of 43 experts —

THIRD REVISED AND ENLARGED EDITION OF

Industrial Chemistry

A Manual for the Student and Manufacturer

Edited by ALLEN ROGERS

In charge of Industrial Chemistry at Pratt Institute, Brooklyn, New York; at one time Major, Chief of Industrial Relations Branch, U. S. A.

Contains many sections of interest to the technical textile and dyeing fraternity; including Dyestuffs and Their Application, by Louis A. Olney; Textiles, by J. Merritt Matthews; Soaps and Soap Powder, by Lincoln Burrows; Laundering, by W. F. Farragher, and others.

1255 pages 377 illustrations $7.50

H O W E S P U B L I S H I N G C O .
4109 Woolworth Building New York City

MATHIESON Chemicals

Deal Direct with the Manufacturer

OUR slogan is an expression of our direct responsibility for the quality of Mathieson Chemicals wherever sold.

This direct responsibility exists whether "Eagle Thistle" products are specified in carload or less-than-carload quantities, for shipment from our works or from our consigned stocks in the hands of local distributors. There is never any middle-man with whom our responsibility is divided.

"Deal Direct with the Manufacturer" has a vital significance to you. It stands for the elimination of uncertainties in price and delivery as well as in quality.

The MATHIESON ALKALI WORKS *Inc.*
25 WEST 43rd STREET NEW YORK CITY

PHILADELPHIA
PROVIDENCE

CHICAGO
CHARLOTTE

EAGLE THISTLE PRODUCTS

Deal Direct with the Manufacturer

Bicarbonate of Soda
Liquid Chlorine-Caustic Soda
Sesquicarbonate of Soda
Bleaching Powder-Soda Ash

CROTON COLOR & CHEMICAL CO., Inc.

293 Broadway, New York City

Manufacturers of Azo Colors

Including Direct, Chrome, Basic and other Specialties

Factory at Croton-on-Hudson, N. Y.

Dealers' Correspondence Invited

Latest 1914 Berlin Edition of

"FARBSTOFFTABELLEN"

By Dr. Gustav Schultz

Containing over 1000 dyestuff formulæ reprinted and exactly reproduced by photographic process on fine white paper, and substantially bound in heavy black cloth and leather.

Can now be had from us at $10 per volume.

HOWES PUBLISHING COMPANY

4109 Woolworth Building, New York

For that silky, soft "kid glovey" finish on fine shirtings, sheer nainsooks, dainty organdies and voiles, on high grade ginghams and sateens, use

Cream Softener J. B.

White goods stay white and even the most delicate shades are not affected by this creamy, white softener.

A finish cannot always be judged satisfactorily immediately after it is applied. Father Time, the most critical judge, often makes an adverse decision after the goods have been on the shelf a few months.

Our Cream Softener J. B. is especially adjusted and standardized to cope with atmospheric, storage and other conditions to which material is subjected after finishing.

We guarantee this softener will not cause any regrets. The first and last decisions will be favorable.

Allow us to send samples
The product will prove itself

Jacques Wolf & Co.
Passaic :: New Jersey

QVALITY COLORS
UNITED STATES COLOR AND CHEMICAL CO. INC.

Anthranol Chrome Blue Black AR

Dyes chrome mordant or top chromed. Recommended for fast shades of navy blue or all classes of stock. On account of its shade, level dyeing properties and solubility it is especially suitable for piece dyeing

Anthranol Chrome Brown W

Dyes chrome mordant or top chromed. Is fast to light and fulling. The most level dyeing brown on the market.

Acid Chrome Blue F 4 B

Similar to the pre-war Chromotrope F4B. Of special interest for dyeing piece goods to leave silk white.

United States Color & Chemical Company, Inc.
93 Broad St. Boston, Mass.

New York Office: 25 Howard St.

FACTORIES:
NEW ENGLAND ANILINE WORKS, Inc.
Ashland, Mass.

GARFIELD ANILINE WORKS, Inc.
Garfield, N. J.

Peerless Direct Fast Yellow N N

Schultz No. 617

Also available in FF and B shades

The clearest and greenest in tone of the Chloramine Yellows — Suitable for cotton, linen, wool, silk and all forms of union goods. Fast to light, chlorine, acids and alkalis. May be used in the same bath with Sulphur Colors. Extensively used in mode shades, browns and greens where great fastness is necessary. No special methods of dyeing are required

Samples and Prices on Request

DUNKER & PERKINS COMPANY

287 ATLANTIC AVENUE BOSTON, MASS.

OUR ACID COLORS

Meet most exacting requirements for colors of this nature to be

FAST TO LIGHT

JENNINGS & COMPANY

INCORPORATED

93 Broad Street **Boston, Mass.**

UNITED CHEMICAL PRODUCTS CORPORATION

IMPORTERS, EXPORTERS AND MANUFACTURERS

YORK AND COLGATE STS., JERSEY CITY, N. J.

Announcing Our New Product

DIRECT FAST BLACK L

Equal in All Respects to the Pre-war Benzo Fast Black L

Sample and Price on Application

CHARLOTTE, N. C. ——BRANCHES—— PAWTUCKET, R. I.

CAMELITE

A stripping agent of highest merit. Does not injure the fibre; leaves no odor. Has very good solubility. Does the work in half the time required by other stripping agents

Packed in air tight and moist proof containers.

AMALTHION BORDEAUX BA

A perfect Sulphur Color, which dissolves entirely in Sodium Sulphide, producing level shades of Maroon or Bordeaux

Fast to cross dyeing, perspiration, alkali; excellent to light

KROMEKO YELLOW F F

Best silk white Chrome Yellow made. Does not need to be cleared. Especially adapted for silk white Chrome Browns.

AMALTHION BROWN R

A fast-to-light Sulphur Color used largely as an individual color, as well as in combination shades of drab, olives, khaki and tans.

Fast to steaming, washing and ironing.

Good to alkalies and acids, and not affected by iron.

Amalthion Brown R has excellent solubility and is level dyeing

Send for Samples and Prices

ESTABLISHED 1876

JOHN CAMPBELL & COMPANY, 75 HUDSON STREET, NEW YORK, N.Y.

American Dyestuff Manufacturers

BRANCHES

BOSTON CHICAGO PROVIDENCE SAN FRANCISCO PHILADELPHIA TORONTO

"STANDARDS EVERYWHERE"

F. E. ATTEAUX & COMPANY, Inc.

172-178 Purchase Street, Boston

Sole Selling Agents for

Palatine Aniline & Chemical Corp.

Poughkeepsie, New York

Palachrome Colors

Palaside—Silk White Effect—Colors

Pacco Direct Colors

Empire Acid Colors

F. E. ATTEAUX & COMPANY, Inc.

BOSTON NEW YORK PHILADELPHIA CHICAGO

Top Dyeing by the Hussong Method

HUSSONG DYEING MACHINES — DOUBLE PRODUCTION SAVE LABOR STEAM DYES

Top in balls, all colors and shades, acid, top or bottom chromed or chromate colors all done with perfect satisfaction in either a HUSSONG skein or raw stock machine, without the use of springs or other accessories.

By the HUSSONG method there is NO FILTERING and THEREFORE NO DEPOSIT on the inside or outside of the balls, NOR IS THERE THE SLIGHTEST ROUGHENING OF THE STOCK.

Loading and unloading is so simple no other method can approach it for output.

IT IS WITHOUT A PEER FOR LEVEL AND SATISFACTORY DYEING.

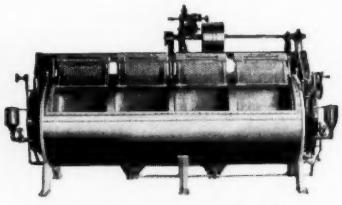
PATENTEES AND MANUFACTURERS

Hussong Dyeing Machine Company - - Groveville, N. J.

Rotary Dyeing Machines for Hosiery

Especially designed for large boil-off capacity on pure and artificial silk. Produces softest, cleanest boil-off work obtainable. Special overflow door in rear to carry off all scum, particles of soap and other matter. Special hand process gives silk finish to cylinder. A size for your particular needs. Write for details.

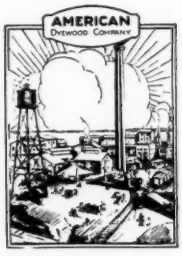
The American Laundry Machinery Co.
Specialty Dept. B Cincinnati, Ohio
The Canadian Laundry Machinery Company, Ltd.
Toronto, Canada
American Laundry Machinery Company, Ltd.
London, England



42x120" American Brass Boil-Off and Dyeing Machine Belt Drive

The Standard of Quality

The satisfactory uniformity and fastness of American Dyewood Company dyestuffs and their exceptional leveling properties have made them the accepted standard.



We carry a full line of Natural and Artificial Colors, specializing in Logwood Extracts and Crystals and Hematine Pastes. Our trademark is your guide in correct dye selection.

Established 1798

Send for Samples

AMERICAN DYEWOOD COMPANY
NEW YORK BOSTON PHILADELPHIA HAMILTON, ONT.
Works at CHESTER, PA.

ESSEX DYESTUFFS

DIRECT YELLOW CF
CHRYSOPHENINE CONC.
DIRECT YELLOW 2G
DIRECT FAST YELLOW B
COTTON YELLOW 5G
DIRECT BROWN 2R
DIRECT BROWN 2Y
DIRECT FAST BROWN M
DIRECT ORANGE R
DIRECT ORANGE 2RE
DIRECT ORANGE 5RE
DIRECT PINK NY
DIRECT PINK 2Y
DIRECT PINK SX
DIRECT FAST SCARLET B
ERICA 2GN
DIRECT ROSE FFB
DIRECT ROSE NB
DIRECT GREEN 2B
CHROME GREEN B CONC.

ESSEX ANILINE WORKS, Inc.

Manufacturers of Aniline Colors.

88 Broad Street, Boston, Mass. Factory at South Middleton, Mass.

The Grasselli Chemical Co., Sole Sales Agents, 117 Hudson St., New York City

Contents of This Issue

July 16, 1923

Dyers in the Making..... 507
M. W. Alling

The Acid Chlorine Bleaching Process..... 510
E. Ristenpart

Common Acid Yellows and Oranges—A Brief Consideration of Their Properties and Uses (concluded)..... 513
George H. Johnston, B.T.C.

The Dyeing of Vat Dyes on Cotton Piece Goods 517
John H. Hennessey, Jr.

Proceedings of the American Association of of Textile Chemists and Colorists:
Fifteenth Research Committee Meeting... 519

Sixteenth Council Meeting 519

Meeting, Lowell Textile Junior Branch.. 520
Members Transferred from Junior to Active Membership 520

Changes of Address 521

Notice from the Secretary..... 521

Proposed By-Laws, Philadelphia Section. 521

Summer Outing, New York Section..... 522

Effects of Treating Materials and Outdoor Exposure Upon Water Resistance and Tensile Strength of Cotton Duck..... 524
T. D. Jarrell and H. P. Holman

Editorials:
Judicial Vagaries 529

The Unfounded Charges Against Herman A. Metz 529

Decision on Italian Dye Taiff Still Hangs Fire 531

Dyestuff Cases Heard and Pending in the General Appraiser's Court 534

1922 Dye Census, Nearly Ready, Shows Domestic Production Increased 66 Per Cent 536

Foreign Dyes Imported Through the Port of New York During June..... 537

Retraction of Publication

CONCERNING HERMAN A. METZ, A WITNESS FOR THE GOVERNMENT IN THE SUIT OF THE U. S. GOVERNMENT AGAINST THE CHEMICAL FOUNDATION, INC.

The following was printed in the Wilmington Morning News in its issue of June 27th, 1923

Colonel Herman A. Metz Paid No Spy in Senate Probe

In the issue of the Wilmington Morning News of June 26, 1923, it was stated that Colonel H. A. Metz, of New York, while testifying in United States District Court, Monday, as a witness for the Government in the suit of the United States against the Chemical Foundation, Inc., admitted that he paid money to a German spy for services in connection with a certain Senate investigation.

The News further stated that Colonel Metz used affidavits to discredit the War Department in a Congressional Committee hearing relating to dyes.

The News further stated that testimony was heard to show that one Edward W. Dieters was a German spy in the employ of German chemical interests; that he had been indicted here; that he had fled the country, and that he had been employed by Colonel Metz to gather information and affidavits used by the United States Senator, George H. Moses, of New Hampshire, in connection with the Senate investigations of the dye interests of this country.

The foregoing statements were false in every particular and were neither reproductions of the testimony nor fair paraphrases thereof.

The testimony as above printed in the News was not given at the trial.

Colonel Metz did not admit that he paid any person shown by the testimony to be a German spy any sum of money whatever. There was no testimony or other evidence to this effect given.

Colonel Metz neither testified nor did anyone else, that he used affidavits to discredit the War Department. On the contrary, Colonel Metz specifically denied that he had employed Edward W. Dieters to render any services to him or to any other person.

It was not testified that Cyril Bennett was a German spy and it was not charged by the defense that he was.

It was not testified to or charged that Edward W. Dieters was a German spy.

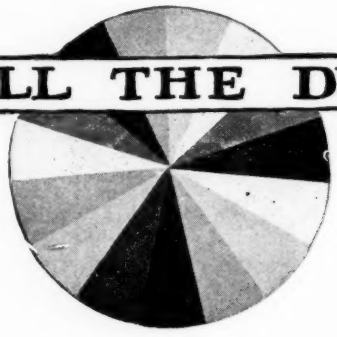
It was neither testified to nor charged that Edward W. Dieters was employed by German chemical interests, nor that he was indicted nor that he fled the country.

It was not testified to or charged that Senator George H. Moses, of New Hampshire, used any affidavits or information prepared by or obtained from Edward W. Dieters, in the Senate or elsewhere, to discredit the War Department or for any other purpose.

Our representative was not in court during the trial. In assembling the information received by our representative from persons present, the impression was gained by him that the testimony as printed in the News had been given. The News had no desire to misrepresent the facts and is glad to make this correction in justice to all concerned.

THE MORNING NEWS,
By CHARLES E. GRAY, Managing Editor.

WHAT WILL THE DYE DO ?



GRAY TONES

For Cloakings and Suitings

Grays, in all tones, are extensively used in plain and stripe effect cloakings and suitings.

National Alizarol Gray DG
National Alizarol Black 3G

are especially suited for dyeing this class of goods, either in the yarn or the piece, as cotton and silk effects are not stained. Their very good fastness and level dyeing properties make them valuable in the production of mode shades as well as grays.

For bluer tones National Superchrome Black PV and National Buffalo Chrome Black 2BN may be used for yarn dyeing.

Avail yourself of the National Laboratory Service for developing your shades and formulae.

National Aniline & Chemical Co., Inc.

40 Rector Street New York, N. Y.

Boston	*Philadelphia*	*San Francisco*
Providence	*Chicago*	*Montreal*
Hartford	*Charlotte*	*Toronto*

"NATIONAL" DYES

NATIONAL U.S.A. DYES

507

AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

VOLUME XII | NEW YORK, JULY 16, 1923 | NUMBER 15

Dyers in the Making

Wide Range of Operations Covered—Training Required to Become a Dyer—Study of Water Used in Dyeing—Miscellaneous Operations Used in Mills—Knowledge Obtained About Other Departments—Keeping Out of a Rut

By M. W. ALLING

Waldrich Bleachery, Delawanna, N. J.

THE dyeing of cotton piece goods covers a very wide range of operations; so many in fact that when one tries to learn them with the idea of becoming a dyer the goal is a very indefinite one to look forward to.

In the first place, it is usually a great surprise for a person to have such an opportunity offered to him, or perchance to drop into this kind of work, for it is not a common occupation. Twenty years ago it was the usual thing to obtain dyers from England, as there were practically no American dyers of repute at that time.

These dyers were looked upon with great respect and their reputations were spread far and wide. This was good advertising for them and it also roused the interest and ambition of the young men who were interested in this kind of work, and they in turn were encouraged by the heads of the different bleaching, dyeing and finishing companies—or, as they are called, bleacheries—to do their utmost to learn this lucrative art.

Nothing else could be expected but that these young dyers and some of the older ones were credited with reputations beyond their knowledge and experience. This condition made them realize that their reputations were hanging in the balance, and this scant knowledge of dyeing urged them on to do their utmost to acquire this experience, and they availed themselves of the opportunities offered to them through books, textile papers, textile schools and in every other possible way, but chiefly through their daily practice. In the meantime this intensified study of their work was showing itself in increased yards of production and a better working ability which was very gratifying to themselves and to their management.

These dyers of the second generation were perhaps more kindly disposed to impart their meager knowledge to their understudies than the older ones were, so that it was not at all unusual for the assistant to catch up with his boss, thereby making it possible for either one to change his position in order to seek new dyeing experiences and possibly a larger salary. If this happened to be the case there was still left a dyer who was well schooled in his work and who could continue it without any great loss to his company.

There is an old saying that "a rolling stone gathers no moss," but there is one thing certain, if it doesn't roll it does not take on a polish, and so it is with a dyer. He feels that he should broaden out his experience, and this thirst for more knowledge of dyeing and the strong desire to advance in his business career sometimes prompts him to take another position where he can learn of things as they are carried on in other mills.

Training Required to Become a Dyer

The range of dyeing operations and the machinery in which the cloth is colored varies so much from one mill to another that the possibilities for gaining an extensive range of dyeing knowledge is only given to one who is willing to venture a change of position and divide his labor between different mills. There are a few bleacheries where the range of dyeing operations is very wide and, of course, these are the ideal places for a dyer to learn his business.

It has been the writer's experience to start his dyeing career in a bleachery where the variety of work was small, although the mill was above the average size. It consisted of dyeing all kinds of cotton piece goods on the jigs and padding machines. The dyestuffs used were of the ordinary type, namely, direct and basic. It also consisted of dyeing logwood black on a continuous machine; the dyeing of tannic acid discharge in navy blue shades and some pioneer work was also done in the dyeing of vat colors.

After seven years in this bleachery another position offered itself and the work in this mill consisted of dyeing all kinds of cotton cloth, but on the whole it was of a

better grade and a larger percentage of the work was full mercerized. The jigs and pads were of a different type. The work consisted of the following operations: The dyeing of direct and basic colors; diazotizing and developing colors for the rain cape trade; sun fast colors; cotton and silk mixtures; cotton and wool mixtures; burlap; fifty-four inch goods; Wood khaki on the jigs, and aniline black.

At the end of seven years in this bleachery another position offered itself. The work in this mill consisted of dyeing all kinds of cotton piece goods. The jigs were about the same as those in the other mills, but here one man ran six jigs, whereas in the other places one man ran only two. This change was accomplished by installing a bonus system, and by having the jigs equipped with the correct make of clutches. The pads were entirely different in this latter plant and carried on the work at a much greater speed.

The processes were the dyeing of direct and basic colors; the dyeing of sulphur khaki on the jigs; the dyeing of navy serges from the gray; the dyeing of pantasoote in fast tan shades to be printed as one can see the window shades of most any trolley car or train; the waterproofing of dyed work; the dyeing of diazotized and developed colors; the dyeing of sulphur khaki, navy and cadet shades on the continuous machine; the dyeing of light shades with sulphur and vat dyes on the pad; the dyeing of khaki on the padding machine with wood dyes; the dyeing of fifty-four inch goods; the dyeing of paranitraniline red; the dyeing of sun fast colors.

In summing up the different dyeing operations in these three mills it will be seen that there were four distinct dyeing operations in the first mill, nine distinct dyeing operations in the second mill, and fifteen distinct dyeing operations in the third mill; the first mill had one operation in common with one operation in each of the other two mills and one operation the same as one of the operations in the third mill. The second mill had one operation in common with one operation in each of the other two mills and besides this it had three operations the same as three of the operations in the third mill. The third mill had one operation in common with one operation in each of the other mills, and besides this it had three operations the same as three operations in the second mill and one operation the same as one of the operations in the first mill. What does this all mean? It means simply this: That the writer at the end of seven years had a very fair knowledge of four dyeing operations; at the end of fourteen years he had a good working knowledge of twelve dyeing operations, and at the time of this writing he has an excellent knowledge of twenty-two different dyeing operations.

By changing from one mill to another this gain of knowledge could go on indefinitely but the dyer who does this is to be compared to a Ford car, which has one-half of its value tied up in accessories which are attached to it. If one tries to sell it he will soon find out that it is still nothing but a Ford, and the selling price is about the market value. It is so with a dyer: he can change his position repeatedly and acquire a vast amount of knowledge about dyeing but his selling price is still about the average.

The buying of dyestuffs is quite an important factor in the career of a master dyer. They are usually purchased under the supervision of the mill chemist with the approval of the dyer. This was the case in the writer's first and third position, but not so in the second position. There it was necessary to interview the dyestuff salesmen, test their products and make the proper selection as to price and quality. This was very interesting work and varied the monotony of the routine.

Study of Water Used in Dyeing

Another condition which varies in different mills is the water in which the actual dyeing operations are performed. The first two positions that the writer held, so far as he knew, the water was free from anything which interfered with the dyeing, but in the third position the water was hard; that is, it contained salts of lime and magnesium.

Some dyestuffs are absolutely insoluble in hard water so that it was necessary to soften every gallon of it used in dyeing, as there was great danger of undissolved particles floating around in the dye solution and adhering to the goods. This was a simple matter to overcome by adding phosphate of soda, but no attention had been paid to the exact amount necessary, so that in some cases too little had been used and the cloth became spotted, and at other times too much had been used and there was a waste. Therefore it became a problem of not only softening the water but of doing it with the exact amount of phosphate of soda to insure the best and cheapest results.

Soda ash is another water softener and is considerably cheaper than the phosphate of soda, but if this is used another problem confronts the dyer. Some dyestuffs when applied in the presence of soda ash take on a change of tone which is not the same as when the dyeing is carried out in a neutral bath. This, of course, is a uniform change of color but after the cloth is folded and the edges exposed to the air, the alkali is gradually neutralized by any acids that may be present in the air, such as nitrous acid, and the neutral tone returns. This makes a streak on the cloth and places the dyeing in a class of not being fast to storing. If such a class of dyestuffs be used the change of tone can be eliminated by an addition of acetate of ammonia to the starch mix when starching the goods.

In order to obtain the benefit of the cheapness of soda ash and still not have an excess of alkali in the dye bath, a test was made to find out just how much soda ash it took to soften a given amount of water. This was done by adding the soda ash until the solution commenced to show an alkaline reaction with litmus paper. The same test was also made with phosphate of soda. These tests had to be made in normal times, as the hardness of the water after a rainstorm was considerably lessened. If

the water had always remained the same degree of hardness it would have been safe to use soda ash alone, as there would have been no danger of an excess of alkali but the rains reduced the hardness and at such time there was too much alkali present so that the greatest care had to be taken in the selection of the dyestuffs. The result of this study was to use two-thirds of the necessary amount of soda ash to take care of the least degree of hardness of the water and one-third of the necessary amount of phosphate of soda to take care of the remainder.

Miscellaneous Operations in Different Mills

Out of the number of mills that the writer has visited, one carried on an average line of work on the cheaper grades of cotton piece goods but there were two dyeing processes which were not carried on in the three mills previously mentioned, namely, the dyeing of logwood and copperas slate and the dyeing of mineral khaki, the latter of which met the Government test for fastness.

The principal work was the dyeing of logwood black by various processes. Some were dyed on a regular logwood black dyeing machine, some on an aniline black machine by omitting the steam box and covering over one of the wash boxes so that the cloth could be run through live steam after the chroming; others were dyed with logwood and bluestone and let lie overnight, then given a run through a bichromate of soda solution the next day; others were impregnated with the logwood by running through a large beck of this solution and afterwards completing the dyeing in the starch; and still others were dyed in the starch by running the goods three times. These last two methods had to be used because the wiggans, as they were called, were so low in grade that the threads would have been pulled out of shape on a regular logwood black machine.

Another of these mills specialized in dyeing of cotton pile or plush goods. These were dyed in the rope state in kettles, which are in reality large wooden boxes filled with the proper amount of dye solution and a few pieces of heavy plush are entered in this bath and run as an endless chain until the bath is exhausted and the correct shade is produced.

Knowledge Obtained About Other Departments

Still another mill carried on a line of work used for lining the tops of automobiles. These goods were dyed with the direct colors on a continuous machine in very dark shades and with sulphur black on another type of a continuous machine. And so one might go on indefinitely explaining these different styles and methods as they are carried on in the various bleacheries, which shows the vast amount of knowledge that it takes to meet the requirements of a bleachery where the variety of work is large.

Another great advantage in dividing one's labor in different mills is that it gives one the opportunity not only to study the art of dyeing but also to study the work that is being carried on in the other departments. These departments include singeing, bleaching, mercerizing, printing, color mixing, copper black dyeing, bluestone black dyeing, starching, finishing, making up, shipping, laboratory work, the making of dyestuffs, softeners, soluble oils and soaps, as well as the mechanical department, including power, light and heat.

The same thing applies in the above departments as it does in dyeing. Every mill has different machinery to carry on its work and by coming in contact with them one can judge of their merits by comparison. It is often the case that these different machines do work which produces the same result, so that the processes have to be changed to fit the machines. This accounts for the fact that there are so many different formulae for the same operation.

The machinery in the first place is installed to carry on the work of the times, but the times change, the line of work changes and the willingness of the manager to tear out and install new machinery does not keep up with the lines of work that he feels obliged to take. So a struggle goes on continually trying to produce a definite result with misfit and misplaced machinery. Some managers realize this gradual breaking down of equipment and a rebuilding process goes on. The old machinery is replaced or changed in its position so that its relationship to the other machines is improved and the old inefficient methods have to be readjusted to meet the new conditions. This is a very trying time: the expense is enormous, the mechanical superintendent is beset with almost insurmountable difficulties, the department heads have to meet the new conditions as they develop by changing their formulae and generally reorganizing their departments. During this time there is always the danger of the work falling off, thereby cutting down profits so that the work in hand has to be slowed up and expenses curtailed before the work can be completed. In any case, if a mill is reputed to do a great variety of work this reconstruction is absolutely necessary to meet the demand and keep up the production, but the sales department is sometimes liable to forget that their mill is equipped with numerous expensive machines which are capable of producing a good standard product at a profit if they are only kept steadily supplied with work.

Keeping Out of a Rut

Although the writer has set forth the advantages of working in different mills in order to learn of new dyeing operations, of seeing how the work is carried on in other departments, of seeing the different machines, of watching the process of reconstruction and of seeing the smoothness with which a mill runs when given the proper machines to do the work, it has not been his intention to recommend to others, especially young dyers, to change their position after working a short time in one place. There are a great many advantages in sticking to one

position and, no matter how small the variety of work is or how small the mill may be, there are just as many opportunities of learning to apply the principles of modern business in mill management, as set forth in any of our best business courses of the present day, as there are in a larger mill. These courses are very useful and every young man who really goes after a higher conception of business principles will do well to fill in his spare time with the study of factory administration, cost finding, business correspondence, corporation finance, accounting principles, etc. There is no need of anyone getting or even thinking that he is getting into a rut, for the opportunities offered are sufficient in these times to make him realize that a rut is not possible where there are so many phases to his work to be mastered.

A foundation of dyeing, a constant watchfulness of what is taking place around one and a genuine interest in the kind of study which will fit one for a broader service is all that is necessary to insure advancement and bigger profits for one's employer and for one's self.

The Acid Chlorine Bleaching Process

The Waldhof Process—Oxycellulose in Different Bleached Samples—Tearing Strength of Fabrics —Conclusions

By E. RISTENPART

(Textileberichte, 1923, 74-5. Translated by Ismar Ginsberg, B.Sc., Chem.)

AS is well known, the presence of acids in the bleaching bath is generally not desirable. Too strong a bleaching action is feared, which may lead to the formation of oxycellulose. Furthermore, there is the possibility of the auto-decomposition of the hypochlorite to chlorate, with the resulting disappearance and loss of active chlorine. Detailed information is found in the technical literature on this subject, particularly in Kind's book, "The bleaching of Textile Fibers," in which it is stated that the addition of acid accelerates the rapidity of the bleaching process only up to a certain point, beyond which it cannot be increased by the action of acid. When all the hypocholrite is decomposed, then on the further addition of acid, chlorine is obtained, which does not possess the bleaching power of free hypochlorous acid:

$$HClO + HCl = H_2O + Cl_2$$

Considerable attention was accordingly claimed rather recently by the new Waldhof process, which is based on the use of acid in the bleaching process. It appeared to be advisable to investigate the process quantit tively, so as to determine the conditions under which it takes place and also so as to obtain a substantiation of the aforementioned opinions, generally held on acid bleaching processes.

Investigation of Waldhof Process

The following experiments were undertaken to this end. One-half a liter of bleaching liquor (1.25 deg. Be.), containing originally 1.427 grams of active chlorine and 14.2 cubic centimeters normal alkalinity (14.2 cubic centimeters of normal sulphuric acid were required for neutralization) was treated with increasing amounts of sulphuric acid. Then 5.5 grams of boiled off fabric were bleached in this liquor for a period of three hours. After the bleaching was completed, the chlorine content and the alkalinity of the bath were determined and the degree of bleaching, the oxycellulose content and the resistance to tearing and the extensibility (elasticity or capability of being stretched) of the bleached product were established. The results of the experiments are given in the table above.

Composition of the Bleaching Bath	After Bleaching Chlorine	After Bleaching Alkalinity	Degree of Bleaching	— Oxycellulose — Characeristics	— Oxycellulose — Q	Tearing Strength	Stretch %
14.2 alkalinity	1.295	14.2	74.8	51—12.0—58.0	6.2	26.6	7.3
5.0 alkalinity	1.1613	— 0.8	72.5	51— 9.5—58.5	7.6	23.7	7.6
0.0 alkalinity	1.153	— 2.2	76.2	50— 9.0—58.5	8.5	23.5	7.1
— 5.0 alkalinity	1.082	— 9.0	76.5	51— 8.5—59.0	8.8	20.6	7.5
— 20.0 alkalinity	1.055	—14.2	69.5	50— 7.5—60.0	9.0	26.2	7.1
—100.0 alkalinity	0.425	—72.2	64.9	50— 7.5—60.0	8.7	25.3	**8.0**
Untreated	.....	....	60.5	51— 9.0—61.0	6.7	25.4	7.3
Double bleaching test:							
(1st, 5) (2nd, 14) alkalinity	1.312	13.0	78.9	51— 8.0—59.5	9.9	21.8	**8.0**
(1st, —5) (2nd, 14) alkalinity	1.312	13.0	79.2	51— 8.5—59.0	9.3	24.7	7.1

In the double bleaching test, the first experiment was carried out with two alkaline baths, one possessing an alkalinity of 5 and the other an alkalinity of 14. In the second experiment one of the bleaching baths was acid, possessing an alkalinity of minus 5 and the other bath was alkaline with an alkalinity of 14.

The figures in the first column of the Table denote the grams of chlorine in the bleach liquor after bleaching. The figures in the second column denote the cubic centimeters of normal solution of sulphuric acid or the cubic centimeters of normal solution of caustic soda (when a negative sign is prefixed to the figure) which were required to neutralize the solution perfectly, using phenolphthalein as an indicator. In the next column the figures denote the degree of the bleaching that has obtained in the cloth by the use of the different bleaching solutions according to the standard method of comparison. The fourth column contains the characteristics of methylene blue dyeing, the fifth column the quotient, which represents the ratio of the white content in the undyed condition (degree of bleaching) to the white content when dyed. The sixth column figures are in kilograms.

In the determination of the oxycellulose content the white content—the average figure is to be taken as the measure—is nevertheless to be taken only for samples which are bleached to approximately the same degree. In the case of samples, in which the degree of bleaching varies very considerably, the sample, which is not bleached as highly, does not in the first place possess as white a color as the other, so that it is dyed more deeply with methylene blue. It accordingly appears as if that sample contains a higher percentage of oxycellulose, due to the deeper color of the dye, for the deeper this color, the more oxycellulose there is in the fiber. But this is not so, as the truth of the matter is that the sample is dyed more deeply because it is not as white as the other to start with.

Oxycellulose in Diffrent Bleached Samples

It is, however, of importance to determine the proportion of oxycellulose in samples of different whiteness, and accordingly the following method was devised to do this: In the first place the quotient of the content of white in the untreated goods divided by the content of white in the untreated colored goods was determined. In the case in question it was found to be 60.5 divided by 9 or 6.7. This ratio must also remain unchanged when both the untreated and bleached goods are compared with respect to their behavior towards methylene blue. If the ratio is exceeded, then this denotes too little white content in the colored goods, accordingly too deep dyeing. The degree, in which the ratio was exceeded, is a measure of the content of oxycellulose in the goods.

The author has made several tests to prove the accuracy of this new method by checking it against others. For example, the samples of cloth were dyed simultaneously with Fehling solution and the copper oxide colors obtained in this way were compared with one another. The values obtained in accordance with the new method, described above, are found in the column Q in the foregoing table. They substantiate the theory that the proportion of oxycellulose in the goods increases as the acidity of the bleaching bath increases.

The fact that the amount is greatest in the case of the double bleaching test is not to be wondered at any more. However, it is rather remarkable to note the slight reduction in the proportion of oxycellulose in the bleached goods in the case of the acid-alkali bleach in comparison with the alkali-alkaline double bleach.

The next column of results, which are concerned with the strength of the bleached goods—that is, the resistance of the same to tearing—also contains figures which are deserving of discussion. In the first place, there is to be remarked the fall in the resistance with increasing acidity of the bleach bath. This is explained by the increased rapidity of the bleaching due to the setting free of active hypochlorous acid. This holds good, however, up to the point where the acidity becomes 5. Suddenly at this point a rise in the resistance to tearing of the bleached goods takes place. This turning point is explained by the fact that the hypochlorous acid is decomposed into molecular chlorine which is not so active in bleaching the cotton goods. This takes place in accordance with the equation given above.

The natural result is that the fabric is spared, but on the other hand the whiteness of the same is not everything that may be desired. However, the entirely new and unexpected fact is that the oxycellulose content of the bleached goods is in no way proportionate thereto, but it rises again notwithstanding the slighter bleaching effect and the good resistance of the textile to tearing. Therefore it is not possible to speak of a positive direct relation between the content of oxycellulose in the textile and the latter's strength and resistance to tearing. The relation that does exist is much more complicated; that is, generally considered. The fact that oxycellulose in the goods is an indication of a reduction in the strength thereof is not gainsaid in any way in spite of this apparent disagreement with the general theory. That at a certain point the strength of the fabric appears to increase, while the oxycellulose content apparently diminished, is just an example of the complicated relation that exists between these two properties of the goods. It shows nevertheless that the goods have been subjected to influences which eventually cause it to become tender, a fact which is not perceived at the outset, but which becomes apparent when the goods are subjected to further treatment. It is generally known that the weakness in the fibers is remarked after further digestion with caustic liquors, and in certain cases even when the treatment is carried out just with pure water alone. It has been assumed that the oxycellulose, which is distributed throughout the fabric, is intermingled and glued together with the unchanged cellulose much like a dextrin paste. In

boiling the fabric with hot water or with an alkaline solution, the oxycellulose is dissolved out, and the natural result is a weakening of the fabric.

Tearing Strength of the Fabrics

In the column of the aforementioned table, in which there are given the results of the tearing strength test made on the fabrics, the last two figures demand our attention. While the loss in the test before the last is explained satisfactorily enough by the double bleaching, the increase in the last test is really remarkable. It will be seen that the sample of goods that was bleached just once in the bleaching bath which possessed an alkalinity of minus 5, possesses a tearing strength of only 20.6. The inference is then that the cotton fabric has become considerably stronger after the subsequent alkaline bleaching treatment. It is rather apparent that in this case there are certain factors which have an important effect on the bleaching process and on the physical properties of the bleached goods but that these factors are not at all simple in character; they do not lie on the surface, so to speak, but must be searched out. Their proper satisfactory explanation requires further experimentation and study. When the action of these factors will be properly understood, the real value of the double bleaching process will be clear.

The chlorine figures in the first column of the table confirm in the nicest possible manner the hypothesis which has been spoken of above, namely, that the convesion of the hypochlorite into chlorate, determined on the percentage of active chlorine still present in the bleaching bath after three hours, increases as the acidity of the bath becomes greater.

The figure 1.312 in the two last experiments on double bleaching indicate the average chlorine content of fourteen, alkaline, secondary bleaching baths after bleaching had taken place. It agrees rather well with the first figure in the column. The latter is a little less, because only the boiled-off sample consumed more chlorine than the prebleached sample in the two last tests.

The alkalinity figures in the second column show a certain agreement with the figures in the sixth column of the same table, inasmuch as in this case, as in the last column, the decrease in the alkalinity of the bleaching bath corresponds similarly to a decrease in the actual value of the bath. But this is so only up to the alkalinity of the bleaching bath corresponds similarly to a decrease in the actual value of the bath. But this is so only up to the alkalinity minus 5. From that point on an abrupt increase takes place. Hence, this increase can be explained as being due in all probability to the same cause that brought about the increase in the sixth column results; that is, it ensues from the conversion of the hypochlorous acid into molecular chlorine. In fact, the equation which was given in the first instance, as explanatory of this behavior of the bleaching bath, shows us that hydrochloric acid disappears in this process. In contradistinction thereto, hydrochloric acid is set free according to the following equation in the same measure as hydrochlorous acid is converted into chloric acid, thus:

$$3HClO \rightarrow HClO_3 + 2HCl$$

The hypochlorous acid on the left side of the equation does not react as an acid with the indicator phenolphthalein.

The figure 13 in the last two experiments, the double bleaching tests, gives the average alkalinity of fourteen, alkaline, baths after bleaching. It does not differ very much from that in the first experiment.

The figures in the third column first indicate a rise in the degree of bleaching and from minus 20 on, a sudden decline. This decline is due to the same cause, as has been cited above, at two points, namely, to the fact the conversion of hypochlorous acid into molecular chlorine decreases the bleaching capacity of the bath. The rise in the degree of bleaching attained in the cotton goods, after complete neutrality or equilibrium has once been reached, has its cause in the unhindered and unbridled action of the hypochlorous acid, which is set free.

Conclusions

1. The decrease in the alkalinity of the ordinary hypochlorite bleaching baths up to the amount minus 10 cubic centimeters normal per liter results in an increase in the transformation into chlorate in the same measure as the alkalinity is reduced. At 28.4 cubic centimeters normal, corresponding to complete absence of hypochlorous acid, is equal to zero during the bleaching process.

2. As the alkalinity of the bleaching bath decreases further, until it reaches minus 10 cubic centimeters normal, the formation of folecular chlorine begins to take place in an increasing measure.

3. In the column one, consequently until minus 10 cubic centimeters normal, the hypochlorous acid that is set free, conditions stronger bleaching action, increase in the oxycellulose content of the bleached fabrics and decrease in their resistance to tearing.

4. In colunm 2, consequently up to minus 10 cubic centimeters normal as well, the molecular chlorine connotes weaker bleaching effect of the bath, preservation of the oxycellulose and increase in the resistance to tearing.

5. In comparison with the alkaline-alkaline double or compound bleaching the acid-alkaline compound bleaching results in the production of bleached goods of a higher degree of whiteness as well as of a greater resistance to tearing. At the same time, the proportion of oxycellulose in the bleached goods is decreased.

BUSHMAN TOURING EUROPE

Victor Bushman, of Victor Bushman & Co., dyestuffs and chemicals including the well-known Atlas Colors, sailed July 5 for a two months' trip through Germany, Holland, and France.

Common Acid Yellows and Oranges—A Brief Consideration of Their Properties and Uses

Part II

Azo Yellow or Curcumeine—Supramine Yellow G and R—Tropaeoline—Orange GG—Orange IV—Sulphon Orange 5G—Croceine Orange G—Orange II—Orange R

By GEORGE H. JOHNSON, B.T.C.

Azo Yellow or Curcumeine

AZO YELLOW is usually a mixture of two isomeric dinitro derivatives of Orange IV (Schultz No. 139) and a small amount of trinitro derivative of Orange IV, two isomeric dinitro diphenylamines, and a trinitrodiphenylamine. It is listed in Schultz under No. 141.

Azo Yellows vary in their reactions toward solubility. Some dissolve readily, while others fail to yield clear solutions. They are usually ochre-yellow powders. The water solution is yellow, and yields red-brown or crimson precipitate or solution when HCl is added. NaOH produces a soluble brownish precipitate. Solution in H_2SO_4 is violet, giving a brownish solution or precipitate upon dilution.

These mixtures are generally applied to wool with acetic acid and Glauber salt. Their properties are listed as follows:

Leveling power—Good with acetic acid. . .
Light—Moderate.
Acids—Good.
Alkalies—Good.
Washing—Moderate.
Carbonizing—Good.
Steaming—Good; shade becomes slightly redder.

Azo Yellows have been used in the production of pastel shades. About 6 to 9 pounds chalk are used per piece of material and added through a sieve to the machine (generally a washer), which has been filled with the requisite amount of water. The pieces are allowed to run through the chalk bath for a few minutes, and then the color is added in several portions. Allow to run fifteen to thirty minutes longer. Rinse. If the chalk used is not pure enough, it is often advisable to mix it with zinc white, using equal portions if necessary. This is especially valuable for the production of delicate pearls.

Silk is dyed in an acidified bath of boiled-off liquor. Floss silk and silk noils are generally dyed in an acetic acid bath without the addition of boiled-off liquor. If the bath is not sufficiently exhausted, add H_2SO_4 near the end of the dyeing. On silk, Azo Yellow is moderately fast to light and to washing.

It is useful in dyeing cotton and wool unions by the single-bath process. This is based on the property of certain direct cotton colors to dye cotton and wool uniformly in a neutral bath at the boil, or of dyeing cotton heavier than wool below the boil. This fact, coupled with the knowledge of a number of acid dyestuffs which will dye wool in a neutral bath without noticeably dyeing or staining the cotton, is quite important. By selecting his colors carefully and regulating his temperatures, the dyer may produce the most varied shades in a single bath.

Azo Yellow is also useful for dyeing satins. These are dyed at or near the boil in an alkaline soap bath with direct cotton colors, using acid or basic colors for brightening. An addition of Glauber salt to the soap bath increases the depth of shade on cotton. Unevenness of shade may be overcome by boiling the bath once or twice.

When used to dye wool and silk union materials, Azo Yellow is dyed in an acid bath at the boil. If the silk is light compared with the wool, turn off the steam and bring the silk to shade in fifteen to twenty minutes by adding more color.

When used for jute dyeing, a concentrated bath containing color and alum is required. Boil for at least half an hour, and then work for at least half an hour longer in a cooling bath. Standing baths may be used, as the colors do not exhaust. As a rule, about 100 gallons of liquor per 100 pounds of material are required for dark shades. For medium and light shades 150 to 200 gallons are sufficient. If copper utensils are used, counteract the effect of the metal with ammonium sulphocyanide.

Straw is dyed in the usual manner (see under "Tartrazine").

Wood fiber is dyed as usual (see under "Quinoline Yellow").

Supramine Yellow G and R

The chemical composition of the Supramine Yellows has not yet been made known.

They are used for dyeing fast and fancy shades on weaving and knitting yarns. They also find use in the

dyeing of ladies' dress goods, blouse materials, blankets, furniture cloth, carpet yarns and bunting. Both colors have the property of resisting an ordinary milling quite well, and consequently may be used on slubbing and loose wool. However, in any case it is well to rinse in an acidified (vitriol) bath after dyeing, and then rinse once more.

On wool the Supramine Yellows possess the following properties:

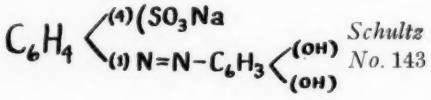
Leveling power—Good.
Light—Very good.
Alkalies—Good.
Washing and milling—Meets ordinary requirements.
Carbonizing—Good; shade returns on neutralizing.
Stoving—Very good.
Steaming—Good.
Rubbing—Very good.

Although when used in conjunction with chromium salts the shades become somewhat duller, the Supramine Yellows may be used in combination with metachrome and top-chrome dyestuffs. Cotton-thread effects are not tinged.

On silk, both dyestuffs yield bright shades of yellow which, however, are not very fast to water. On wool and silk fabrics, almost uniform shades are obtained. Finally, as the Supramine Yellows dye well in a neutral Glauber salt bath, they are useful for shading wool in half-wool material dyed according to the one-bath method.

Tropaeoline

Tropaeoline is the sodium salt of para-sulphobenzene-azo-resorcin:



Schultz No. 143

Tropaeoline is a brown powder which gives an orange-yellow solution when dissolved in water. Hydrochloric acid has no effect upon the solution. Caustic soda changes it to red-orange. Solution in H_2SO_4 is yellow. It becomes orange-yellow upon diluting with water.

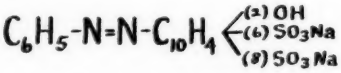
It is applied to wool with the aid of Glauber salt and sulphuric acid, producing a reddish yellow, almost orange, shade.

Leveling power—Very good.
Light—Fair.
Washing—Fair.
Acids—Good.
Alkalies—Turns brown-red.
Stoving—Not good.
Steaming—Not good.

Tropaeoline is applied to silk in acidified boiled-off liquor. Start the bath at about 110 deg. Fahr. and then raise the temperature to 200 deg. Fahr. After dyeing, rinse and brighten. On silk, Tropaeoline, or Resorcin Yellow as it is sometimes called, possesses fairly good fastness to light.

Orange GG

Orange GG is the sodium salt of benzene-azo-beta-naphthol-6.8-disulphonic acid:



Schultz No. 38

Orange GG is sold as an orange-red powder or crystalline leaflets. Its aqueous solution is orange-yellow. HCl causes no change, while NaOH turns it yellow-red. Solution in H_2SO_4 is orange-yellow, as color of which does not change when water is added.

Orange GG is a very valuable acid orange which is extremely level dyeing and possesses good fastness to light. It produces a yellow shade of orange and is very valuable as a shading color and in the production of self and mode shades.

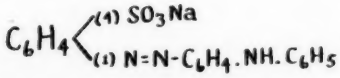
Leveling power—Excellent.
Light—Very good.
Alkalies—Good.
Washing—Not good.
Acids—Good.
Stoving—Good.
Steaming—Good.
Leaves cotton and silk effects clear.

It is applied to wool with the aid of Glauber salt and vitriol.

On silk, Orange GG gives shades of very good fastness to light, acids and stoving. It is useful in the production of shot effects upon silk and wool unions. If the silk is stained slightly the color may be stripped by any of the usual methods, leaving the silk white.

Orange IV

Orange IV is the sodium salt of para-sulphobenzene-azo-diphenylamine:



Schultz No. 139

Orange IV is an orange-yellow powder not readily soluble in water. Its water solution is orange-yellow. HCl produces a gray precipitate and a red-violet solution, NaOH a soluble light yellow precipitate. Solution in H_2SO_4 is blue-violet. On diluting, a purple precipitate separates out.

It is applied to wool and silk in the usual manner. On wool, it possesses the following properties:

Leveling power—Very good.
Light—Good.
Alkalies—Moderate.
Washing—Moderate.
Acids—Poor.
Stoving—Poor.
Steaming—Not good.

Orange IV finds its greatest use as a shading color on wool and silk.

Sulphon Orange 5G

This dyestuff has not been classified chemically.

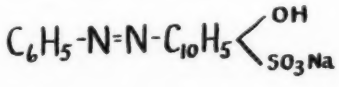
Sulphon Orange 5G is applied to wool with Glauber salt and acetic acid. Enter the material at 120 deg. Fahr. and raise slowly to the boil. After boiling half an hour, exhaust with a further addition of acetic or formic acid.

Leveling power—Good.
Light—Fairy good.
Alkalies—Very good.
Washing—Very good.
Milling—Good.
Carbonizing—Shade turns violet; returns on neutralizing.
Stoving—Good.
Steaming—Good.
Rubbing—Good.

Sulphon Orange 5G is valuable in that a bright orange is produced which is fast to washing. It is especially suitable for dyeing hosiery, loose wool and slubbing. It also finds use in the shoddy trade. Although chromium salts dull the shade, Sulphon Orange may be used for shading chrome colors. It leaves cotton-thread effects perfectly clean. This dyestuff may also be used for shading half wool according to the one-bath method, for it tends to dye wool in a neutral bath.

Croceine Orange G

Croceine Orange G is the sodium salt of benzene-azo-beta-naphthol-6-sulphonic acid:



Schultz No. 37

It is a fiery red powder giving an orange-yellow water solution. HCl forms an orange precipitate. NaOH produces no change. Its solution in H_2SO_4 is orange-yellow. On diluting, a brownish-yellow precipitate is formed.

Croceine Orange G finds considerable use because of its brilliant shade and good fastness to light. It is also important in paper staining and in the manufacture of pigment colors.

It resembles Orange GG in properties, except producing a redder shade of orange. Its tinctorial power is also greater. It is applied to wool in the usual manner with Glauber salt and vitriol.

Leveling power—Very good.
Light—Very good.
Alkalies—Good.
Washing—Not good.
Acids—Good.
Stoving—Moderate.
Steaming—Very good.

Croceine Orange G is adapted for silk dyeing. It also finds use for dyeing weighted silk. Dye in a boiled-off liquor bath with as little water as possible and only very slightly broken with acetic acid. Enter the material at 100 deg. Fahr., raise after a time to 140 deg. Fahr., and later nearly to the boil. After dyeing, rinse well and brighten with acetic acid.

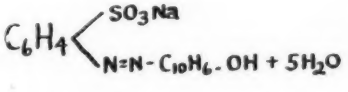
In dyeing wool-silk unions, Croceine Orange G dyes silk and wool practically the same shade. Glauber salt should not be used, as the silk tends to lose its luster at the boil in the presence of the salt. Enter at a low temperature and bring to the boil. When the wool has approximately the desired depth of shade, turn off the steam and dye the silk in the cooling bath, adding more color if necessary.

Cotton may be dyed with this color. Use a very short bath at about 120 deg. Fahr., with the addition of 5 to 10 per cent alum and 20 to 40 per cent common salt. Allow to cool in the bath. Wring evenly without rinsing, and dry.

Croceine Orange G is also used in dyeing jute. Dye at the boil with 2½ per cent alum and 2½ per cent oxalic acid.

Orange II

Orange II is the sodium salt of para-sulphobenzene-azo-beta-naphthol:



Schultz No. 145

It is a yellow-red powder giving an orange-yellow aqueous solution. HCl causes the formation of a dark orange precipitate. NaOH, brown-red. It dissolves

in H_2SO_4, giving a crimson-red solution which yields a brown-yellow precipitate on diluting.

Orange II is extensively used in the textile industry and also in paper, pigment and leather manufacturing.

It is dyed on wool with Glauber salt and vitriol.

Leveling power—Very good.
Light—Fair.
Washing—Fair.
Alkalies—Good.
Acids—Good.
Stoving—Not good.
Steaming—Good.

In the dyeing of shoddy, faster results are obtained with Orange II if it is dyed on a chrome-copper mordant (see under "Metanil Yellow"). It may be used for dyeing pastel colors. It is often used on cheaper grade woolen piece goods for producing browns; also finds use in the ladies' dress goods and yarn-dyeing fields.

Cotton may be dyed with Orange II according to the regular procedure, the resulting shade being moderately fast to light but not to washing.

Orange II is also valuable in the silk-dyeing trade. The silk is dyed in acidified boiled-off liquor, usually prepared by adding 10 to 15 gallons boiled-off liquor to 30 to 45 gallons of water, adding sufficient sulphuric acid to redden blue litmus paper. Heat to 100 deg. Fahr., turn the boiled-off silk several times, lift, and add the well-dissolved dyestuff. Enter the silk, turning rapidly at first. Then raise the temperature to 140 deg. Fahr. and finish at the boil, lifting the goods and boiling up the bath from time to time. If when matching it is found necessary to add more color, to promote levelness and thorough fixation, it is advisable to bring the bath to the boil again. Repeated boiling, however, tends to damage the silk.

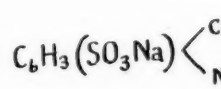
Tussah silk may be dyed without boiled-off liquor, using a weakly acid bath. After dyeing, hydro-extract and dry without rinsing. When dyeing pale shades on bleached material, it is best to use acetic acid, although vitriol may be used for medium and dark shades. On silk, Orange II produces shades of moderate fastness to water and against bleeding into white silk. Its fastness against light is fairly good.

In union dyeing, Orange II finds value because of its property of dyeing wool in a neutral bath and not dyeing the cotton. In dyeing gloria in a strongly acid bath Orange II dyes wool and silk practically alike.

Orange II also may be used for dyeing jute, straw and wood chip.

Orange R

Orange R is the sodium salt of sulpho-ortho-toluene-azo-beta-naphthol:



Schultz No. 151

Orange R is a brick-red powder. It dissolves readily in water, giving a reddish orange colored solution. HCl when added to this forms a gelatinous yellowish brown precipitate, while NaOH forms a soluble brownish-orange precipitate. Its solution in H_2SO_4 is crimson. On diluting, a yellowish-brown precipitate appears.

It is applied to wool with the aid of Glauber salt and vitriol.

Leveling power—Very good.
Light—Fair.
Washing—Fair.
Alkalies—Good.
Acids—Good.
Stoving—Not good.
Rubbing—Very good.

Orange R is redder in shade than Orange II, but in other respects is practically identical with the latter product.

NATIONAL ISSUES DYER'S FORMULAS FOR FALL, 1923, SEASON SHADE CARD

The color-using trades will be glad to know that the National Aniline & Chemical Company, Inc., has just issued its semi-annual booklet of Dyer's Formulas for matching the fashionable shades for the coming season as announced in the 1923 Fall Season Shade Card of the Textile Color Card Association of the United States, Inc. In addition to the formulas, methods for dyeing are given for obtaining the designated shades on skein silk, cotton, wool and leather.

Copies may be obtained upon request made to any of the "National" branch offices.

GEIGY ANNOUNCES ERIO CHROMAL SERIES

The Geigy Company announces placing on the market a series of chromate colors which is known by the trade name Erio Chromal. These colors are designed for dyeing by the chromate or chrome in the bath method and leave silk unstained. Their fastness to both light and fulling is excellent.

GENSSLER LEAVES GRASSELLI

Dr. O. K. Genssler, who for the past three and a half years has been connected with the dyestuff department of the Grasselli Chemical Company as technical adviser to the sales manager and head of the technical department, has severed his connection with this concern as of July 1.

The Dyeing of Vat Dyes on Cotton Piece Goods

Types of Machines—Wetting-Out Bath—Preparation of Color—Importance of Temperature—The Padder Method—Description of Padder—Preparation of Bath—The Padder-Jig Method

By JOHN H. HENNESSEY, JR.

A Paper Presented at the Twenty-second Annual Meeting of the Alumni Association of the Philadelphia Textile School

(All rights reserved.)

PRACTICALLY ever since the discovery of the first vat color by R. Bohn, in 1901, the aim of the managers of cotton-finishing plants has been the application of these dyes to cotton piece goods, but naturally at a cost not prohibitive. To-day, twenty-two years later, we find that such processes really continue to be in a stage of development and, because of the increasing demand for fast, bright colors, are a source of interest to the textile world.

Types of Machines

While from time to time the use of various types of machines has come to our notice, such as the dipping frame and the under-water jigger, we now find that the jig and pad are more important, both from the financial as well as from the practical point of view. A brief description of them will be given when the various methods in general use at the present time are considered.

For convenience, let us divide the methods to be discussed according to the machines on which they are carried out. We shall then have:

1—The jig method.
2—The pad method.
3—The pad-jig method.

The jigger referred to is the ordinary silk-cotton jigger, preferably lead-lined. While any weight cloth may be dyed directly on the jig, the cost of such an operation for securing medium and heavy shades prohibits the use of this method for voiles, warp sateens, filling sateens, etc. The heavier grades of material, on the other hand, are best dyed on the jig on account of the insufficient penetration obtained on the pad.

The cloth, prior to dyeing, must previously have been framed, otherwise the dye will oxidize on the selvages first and during subsequent runs will naturally pick up more dye than the better protected interior portion of the roll.

The size of the roll and the manner of threading the jig are very important factors, since upon them depend the degree of "splashing" while the jig is in operation. Unless this splashing is limited to a minimum, the goods are liable to be spotted. It has been found that a roll when wound on the jig beam is suitable if it does not extend more than 8 inches beyond the surface of the beam.

Obviously, the yardage would depend upon the weight of the material, probably running from 300 to 600 yards. The accompanying diagram, dotted line,

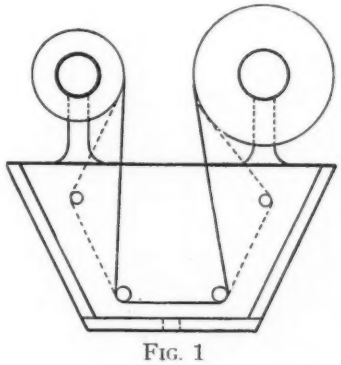


FIG. 1

shows the manner of threading, also the usual manner of threading, shown by solid line, when splashing is not an objection.

Wetting-Out Bath

While the use of a short bath might seem to have many advantages, such as high concentration and a correspondingly lower cost of dye, the advantages of a long bath outweigh them. With the former the dye jumps on the ends of the roll, making subsequent leveling a tedious task; also greater oxidation occurs, since the distance from the level of the liquor to the roll is greater.

The wetting-out bath of about 100 gallons contains 5 pounds of sodium hydrosulphite, 5 quarts of caustic soda, 53 deg. Tw., and 3 pounds of sodium sulphide. The use of the latter has been found to be of advantage in retarding the "breaking down" of the vat. As many as fifteen to twenty ends may be run with this amount of sulphide present. The temperature of this bath is 120 deg. Fahr.

Preparation of Color

The preparation of the dye for dyeing as well as for its subsequent preservation is of the utmost impor-

tance. Mere straining of the dye paste is not sufficient. In order that it be in the finest possible state of division, the dye paste, mixed with one-half as much of a 6 per cent dextrin and 5 per cent of glycerine, should be ground in an ordinary printer's grinder. In this condition the dye may be retained in crocks for months with very little evaporation and absolutely no settling in the bottom. Since this paste weighs approximately 12 pounds to a gallon, it can thus be very conveniently measured out for use in the dye bath. The dye is measured out into a small-sized tub nearly filled with water heated to the proper temperature for reduction. Sufficient caustic of 53 deg. Tw. strength to insure solution is added. From one-quarter to one-third as much hydrosulphite as color is slowly shaken into the stock vat, stirring constantly until reduction is complete. The clear color of the vat is indication of complete reduction.

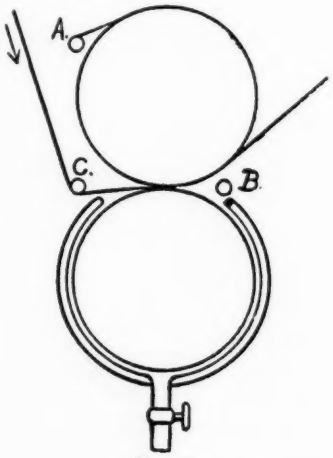


FIG. 2

IMPORTANCE OF TEMPERATURE

After the wetting-out process, the bath is brought to that temperature best suited for the particular dye in use. For instance, the Algols dye best at a temperature between 90 to 100 deg. Fahr., while the Indanthrenes dye best around 120 deg. Fahr. Each class of dyes has its respective dyeing temperature, which must be adhered to if good results are to be obtained. When use is made of mixtures containing members of different classes, a mean temperature is employed.

The dye is divided in such a manner that nearly the entire quantity is added at the completion of four ends, at which time a patch is taken, rinsed, chromed and soaped. At the end of each run, the temperature of the bath is brought to the dyeing temperature, depending upon the dye in use. The jig should be kept in continuous operation, otherwise "settling" in the roll will occur, giving uneven shades. The bath is by no means exhausted at this time, thus allowing further runs to be made for the purpose of obtaining the desired shade. Further additions of color are made in the manner as previously outlined, until the bath shows evidence of "breaking down," in which case a sufficient quantity of hydrosulphite must be added to give a clear bath. It must be understood, at this time, that economy would not permit the use of sufficient color to give the desired shade on four ends. Less dye, naturally, is leaving the bath on each run, but the process of leveling is also being accomplished. It may thus be said with safety that eight ends in dye are the minimum.

Proper rinsing of the material is another important operation, and is carried out satisfactorily by giving six ends in a running water bath kept short by means of a small overflow pipe placed in the plug hole. The small amount of caustic remaining will be neutralized in the succeeding bath, which contains 2 pounds of chrome and 1 pound of sulphuric acid. Complete oxidation of the color occurs in this bath, the sulphuric acid at the same time exerting its tendency to brighten certain shades. The excess of acid is washed out and the goods shelled up, mangled, soaped in a rope soaper and dried.

THE PADDER METHOD

When the application of vat colors to cotton pieces was an accomplished fact of natural sequence, the next step was one looking toward a reduction in the cost of operations. Production was the watchword, and with this in mind our attention was soon drawn toward the padder. Much time and money were expended in this direction, and to-day we find the type of pad which gives every indication of being satisfactory.

The ordinary pad was found to have many features not conducive to successful fast color dyeing but which for direct colors offered no serious objection. The condition of the bowls is of primary importance; the least variation in the smoothness of their surface will cause noticeable streaks in the goods. This streakiness is probably never apparent when direct colors are used, showing the necessity for great attention to details that ordinarily would receive but scant notice.

DESCRIPTION OF THE PADDER

The padder referred to is of the two-bowl type, the latter being 10 inches in diameter and rubber-covered. The box consists of a cast-iron shell, one-quarter of an inch in thickness, fitting closely around the bottom bowl. The space between the two is only about one-quarter of an inch. In this manner the surface of the liquor exposed to the air is very small, so that oxidation and the subsequent formation of a scum in the pad box is practically impossible. *Fig.* 2 shows this arrangement: A is a leather "doctor" for removing lint; B is a spray pipe, through which the color flows; C is a tension bar. As may be observed in the dia-

(*Continued on page* 523.)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

Vice-Presidents
WILLIAM D. LIVERMORE WILLIAM H. CADY

Secretary
WALTER E. HADLEY
5 Mountain Avenue, Maplewood, N. J.

Treasurer
WINTHROP C. DURFEE
516 Atlantic Avenue, Boston, Mass

Councilors

ELMER C. BERTOLET	GEORGE A. MORAN
ARTHUR E. HIRST	WILLIAM K. ROBBINS
WILLIAM R. MOORHOUSE	WALTER M. SCOTT

LOCAL SECTIONS AND THEIR OFFICERS

Northern New England Section—
Hugh Christison, Chairman, Arlington Mills, Lawrence, Mass.
A. K. Johnson, Secretary, Lowell Textile School, Lowell, Mass.

Rhode Island Section—
Ralph F. Culver, Chairman, Box 269, Providence, R. I.
Leslie L. Bamberger, Secretary, U. S. Finishing Company, Providence, R. I.

New York Section—
Elvin H. Killheffer, Chairman, Newport Chemical Works, Passaic, N. J.
Herbert Grandage, Secretary, 121 Willard Avenue, Bloomfield, N. J.

Philadelphia Section—
Robert E. Rose, Chairman, E. I. du Pont de Nemours & Co., Wilmington, Del
Elmert C. Bertolet, Secretary, Philadelphia Textile School. Philadelphia, Pa

FIFTEENTH RESEARCH COMMITTEE MEETING

The Fifteenth Research Committee Meeting of the American Association of Textile Chemists and Colorists was held on June 22, 1923, at the Engineers' Club, Boston, Mass. The following members were in attendance: Prof. L. A. Olney, William D. Livermore, William H. Cady, A. E. Hirst, W. C. Durfee, George A. Moran, William R. Moorhouse, Dr. W. M. Scott, R. F. Culver, Dr. W. J. Murray and W. E. Hadley.

The committee investigating the fastness of dyed fabrics to light, William H. Cady, Chairman, reported excellent progress.

The following committees were appointed to consider the various fastness tests as enumerated:

Rubbing on Silk—Dr. W. M. Scott.
Rubbing on Cotton—George A. Moran.
Rubbing on Wool—William D. Livermore.
Fastness to Finishing Processes:
Steaming—William D. Livermore.
Decating—William D. Livermore.
Boiling—William D. Livermore.
Fastness to Alkalies—William R. Moorhouse.
Fastness to Acids—William R. Moorhouse.

The subjects of Fastness to Calendering, Ironing and Hot Pressing, Fastness to Fresh and Salt Water, Fastness to Sulphur Dioxide, and Fastness to Hydrogen Peroxide will later be considered.

The Fastness to Perspiration and Urine will be in charge of Hugh Christison.

Respectfully submitted,
W. E. HADLEY, Secretary.

SIXTEENTH COUNCIL MEETING

The Sixteenth Council Meeting of the American Association of Textile Chemists and Colorists was held June 22, 1923, at the Engineers' Club, Boston, Mass. The following members were in attendance: Prof. L. A. Olney, William D. Livermore, William H. Cady, A. E. Hirst, W. C. Durfee, George A. Moran, William R. Moorhouse, Dr. W. M. Scott, R. F. Culver and W. E. Hadley.

The following applicants were admitted to membership:

Active Membership

Adler, Rudolph W., 1551 East Boulevard, Cleveland, Ohio.
Superintendent Dyeing, Erie Dyeing & Process Company.

Ambler, Harry, 6 Woodland Street, Saylesville, R. I.
Assistant Overseer Dyeing, Glenlyon Yarn Dye Works.

Brandy, William F., Box 99, Lawrence, Mass.
Treasurer, H. Klous & Co., Lawrence, Mass.

Gordon, Dr. H. B., 316 Hudson Street, New York City.
Chemist, U. S. Testing Company.

Hansen, Edwin L., 417 Oley Street, Reading, Pa.
Dyer, Schuylkill Hosiery Mills.

Kilduff, Frank B., P. O. Box 56, Sanford, Me.
Assistant Overseer Dyeing, Sanford Mills.

Miller, Percival, 619 Hospital Trust Building, Providence, R. I.
Salesman and Demonstrator, Newport Chemical Works.

Pollock, Martin D., 211 West Fifty-eighth Street, New York City.
President and General Manager, Union Dyeing & Finishing Works.

Schmidt, Milton S., 148 Horton Avenue, New Rochelle, N. Y.
Textile Engineer, E. F. Timme & Son, New York City.

Junior Membership

Frazer, Maurice D., 238 Liberty Street, Lowell, Mass.
Laboratory Assistant, Massachusetts Cotton Mills.

Kittredge, Roland, 59 Bunkerhill Street, Lawrence, Mass.
Apprentice, Pacific Print Works.

Lundquist, Albin R., 177 Decatur Street, New York City.
Colorist, Commonwealth C. & C. Company.

Stone, Charles, 12 Walker Place, Lowell, Mass.
Student, Lowell Textile School.

Storin, Edmund A., 422 West Avenue, Pawtucket, R. I.
Chemist, U. S. Finishing Company.

Wall, Joseph J., 63 E. Walnut Lane, Philadelphia, Pa.
Dyer, Nicetown Dye Works.

Brackett B. Fernald, of the Imperial Printing Company, Providence, R. I., was transferred from Junior to Active Membership.

The Secretary was instructed to write a letter to Dr. R. E. Rose, who is recovering from a serious illness, extending the sympathy of the Council and expressing the wish that the coming months may restore him to health and strength.

A letter was read from Secretary Bertolet of the Philadelphia Local Section suggesting that the name of such Section be changed to Middle Atlantic Section, and the Council voted that they would approve such a change if the Philadelphia Section voted in favor of same.

Regarding the subjects for which prizes have been offered, it was the wish of the Council to draw the attention of competing members to the impossibility of acknowledging receipt of manuscripts, under the terms of the competition, as the members will not be known until such time as the envelopes containing the names of the authors are opened.

Respectfully submitted,
W. E. HADLEY, Secretary.

LOWELL TEXTILE JUNIOR BRANCH

The second meeting of the Lowell Textile School Branch of the American Association of Textile Chemists and Colorists was held at the Lowell Textile School May 19, 1923.

Winthrop C. Durfee, of Boston, was the speaker, and he presented a very interesting paper on the "Use of Bichromates in Mordanting and Dyeing." Details of this paper may be found in the January 29, 1923, issue of the AMERICAN DYESTUFF REPORTER.

Respectfully submitted,
ROBERT W. JAEGER, JR.,
Secretary and Treasurer.

A business meeting of the Lowell Textile School Branch of the American Association of Textile Chemists and Colorists was held on May 17, 1923.

The following students were elected for the ensuing year:

George P. Feindel, President.
Edward B. Bell, Vice-President.
George W. Pierce, Secretary and Treasurer.

Respectfully submitted,
ROBERT W. JAEGER, JR.,
Secretary and Treasurer.

TRANSFERRED FROM JUNIOR TO ACTIVE MEMBERSHIP

Adler, Rudolph W., 1551 East Boulevard, Cleveland, Ohio.

Ambler, Harry, 8 Woodland Street, Saylesville, R. I.

Brandy, William F., Box 99, Lawrence, Mass.

Fernald, Brackett B., 14 Elgin Street, Providence, R. I.

Frazer, Maurice Douglas, 238 Liberty Street, Lowell, Mass.

Gordon, Dr. H. E., United States Testing Company, 316 Hudson Street, New York City.

Hansen, Edwin L., 417 Oley Street, Reading, Pa.

Killduff, Frank B., P. O. Box 56, Sanford, Me.

Kittredge, Roland, 59 Bunker Hill Street, Lawrence, Mass.

Miller, Perceval, 619 Hospital Trust Building, Providence, R. I.

Pollack, Martin D., Union Dyeing & Finishing Works, 624 East Nineteenth Street, New York City.
Schmidt, Milton, 148 Horton Avenue, New Rochelle, N. Y.

CHANGES OF ADDRESS

The following changes in addresses of members should be noted:

Baxter, George L., 116 Railroad Avenue, Mamaroneck, N. Y.
Blauvelt, Russell, Cincinnati Chemical Works, Cincinnati, Ohio.
Chen, W. P., Mackey Apartment, 529 West 123rd Street, New York City.
Christison, Leslie, 31 Enmore Street, Andover, Mass.
Creaser, J. H., 28 Beaufort Street, Providence, R. I.
Duffy, Edward J., Lebanon Chemical Company, Inc., Mill and Cross Streets, Pawtucket, R. I.
Grady, J. H., 87 Brook Road, Milton, Mass.
Monroe, Claxton, Assabet Mills, Maynard, Mass.
Sampson, A. H., 35 Hartford Street, Boston, Mass.
Sawyer, Joseph W., 67 Abbott Street, Lawrence, Mass.
Hinckley, E. H., 17 Battery Place, New York City.
Huntington, Arthur P., 12 Bellevue Street, Lowell, Mass.
Hobby, Amos K., R. F. D. 27, Newfield, N. Y.
Harley, Alex., Barker Estate, Main Road, Tiverton, R. I.
Jeffries, W. H., Kuttroff, Pickhardt & Co., Inc., 128 Duane Street, New York City.
Johnson, Arthur O., Geigy Co., Inc., 46 North Front Street, Philadelphia, Pa.
Lawton, H. F., 199 North Main Street, Fall River, Mass.
Oesterle, F. J., Arnold Print Works, North Adams, Mass.
Watson, Warren N., Duxbury, Mass.
Wilmot, H. F., Room 343, 1 Madison Avenue, New York City.

NOTICE FROM THE SECRETARY

Applications for Membership in the American Association of Textile Chemists and Colorists

All individuals who believe that they are eligible for membership in the Association and are desirous of affiliating with the organization can communicate with the Secretary, who will gladly furnish application blanks and extend to them every possible assistance.

It is desirable that members of the Association should make an effort to interest all those who they believe would make desirable members.

The Secretary will at all times be pleased to provide members with as many application blanks as may be desired.

WALTER E. HADLEY, Secretary,
5 Mountain Avenue, Maplewood, N. J.

PROPOSED BY-LAWS—PHILADELPHIA SECTION

The name of this organization shall be the Philadelphia Section of the American Association of Textile Chemists and Colorists.

The object of this organization shall be:

To promote increase of knowledge of the application of dyes and chemicals in the textile industry.

To encourage in any practicable ways research work on chemical processes and materials of importance to the textile industry.

To establish for the members channels by which the interchange of professional knowledge among them may be increased.

To promote acquaintance and feelings of good fellowship among the members of this Section.

All active and junior members of the A. A. T. C. C. shall be entitled to membership in this Section. Guest members shall be persons who for some reason or other do not come under the heading of the above classes of membership, but who are interested in the endeavors of the Section and express a desire to take part in the meetings. Upon receiving their application the Sectional Committee shall vote upon their admission to guest membership.

The annual dues of all members of this Section shall be payable in advance at the first fall meeting.

A Chairman, Secretary, and Treasurer, and four members to constitute the Sectional Committee shall be elected at the first meeting in any calendar year, and all officers so appointed shall serve for one year only, except the Secretary.

Nominations shall be made from the floor. A list of nominees may be suggested by a committee appointed by the Chairman for that purpose.

Election shall be by balloting.

In case of vacancy, nomination and election for the balance of the term shall take place at the next stated meeting.

The Chairman shall preside at all meetings and is *ex officio* a member of the Council of the A. A. T. C. C. In case of absence of the Chairman, the meeting shall be presided over by the Secretary for the business part and

Some of the Members of the New York Section Present at the Summer Outing Wednesday, July 11, at the Green Brook Country Club, North Caldwell, N. J.

by the Chairman of the Program Committee for the professional part of the meeting. The Chairman may appoint committees to take charge of special affairs as he may deem advisable.

The Secretary shall keep the minutes of the meeting and shall advise the members from time to time as to the proceedings. The Secretary shall submit to the Secretary of the A. A. T. C. C. an annual report of the proceedings of the Section each year before December 1.

The Treasurer shall look after the financial transactions of the local Section and shall pay all bills approved by the Section out of funds due from contributions from A. A. T. C. C. and sectional dues. The Treasurer shall furnish the Treasurer of the A. A. T. C. C. with an annual account of receipts and expenditures each year before December 1.

Stated meetings of the local Section shall take place every two months with the exception of the summer months. The date of these stated meetings shall be fixed at the first fall meeting.

A special meeting may be called by the Chairman or the Sectional Committee.

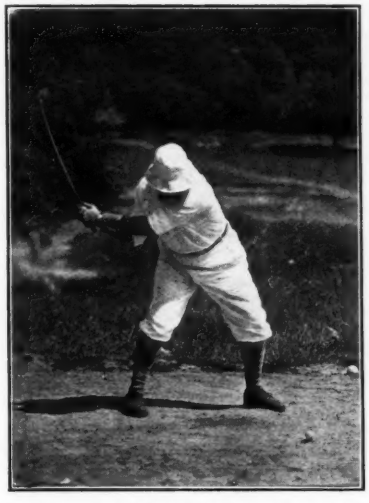
SUMMER OUTING, NEW YORK SECTION

Excellent weather and a high degree of success attended the summer outing of the New York Section, held Wednesday, July 11, at the Green Brook Country Club, North Caldwell, N. J. Twenty-three members had put in an appearance by lunch time, while twenty-eight responded to the call for dinner, but some who came earlier in the day and were unable to remain for the latter meal brought the total up to thirty-three. Many of those present elected to play around the club's golf course or to indu'ge in putting practice during the morning, and in the afternoon the tournament for the silver cup donated by Chairman E. H. Killheffer, card games on the veranda or restful lounging under the trees, occupied the time. The cup was won by R. Fitzgibbon with a net score of 105 for the eighteen holes, and was presented by Dr. Killheffer at the dinner. Late in the afternoon those who were not yet out on the links were assembled for a group picture, shown herewith. It was agreed that the various items of the program were run off with such smoothness as to reflect credit on those in charge of the arrangements, which fact, coupled with the picturesqueness of the surroundings and the excellence of the fare provided, made the occasion a most enjoyable one.

HERBERT GRANDAGE, Secretary.

The Reporter's Own Sport Supplement

Demonstrating That Sporting Captions Are Just Too Easy for Anything!



BOBBY JONES PLEASE WRITE—Elvin H. Killheffer, Vice-President Newport Chemical Works and genial chairman of the N. Y. Section, about to descend on the ball with characteristic vigor at the opening of the golf tournament.

NO HEADACHE IN A BAR'L OF IT—The "Nineteenth Hole" at the Green Brook Country Club, from a photograph of this wayside shrine to Volstead made late in the day. Note depletion of supply and signs of hard usage. . . . No, Rollo, we too patronized the Twentieth.

NOTE THOSE STANCE!—H. F. Wilmot, Technical Adviser, Synthetic Organic Chemical Manufacturers' Association, making ready to propel the pill for a row of birdies. Mr. Wilmot shoots a braw game o' gowf, but believes in keeping at least one eye on the camera.

SEEN AT THE NEW YORK SECTION, A. A. T. C. C., SUMMER OUTING

THE DYEING OF VAT COLORS ON COTTON PIECE GOODS

(*Continued from page* 518.)

gram, the cleaning out of the pad box is no simple matter, so that this style of machine is not without some disadvantages.

A lead-lined stock tank proves to be superior to an iron or ordinary wooden tank. The iron has a tendency to oxidize the reduced dye, while the combined action of the caustic and sodium sulphide has an injurious action on the wood.

As previously stated, the heavier grades of cloth cannot be dyed on the pad with any degree of success; neither can medium or heavy shades be dyed, regardless of the character of the cloth. For light shades and tints on voiles, sateens and shirtings, this method is by far the cheapest and, in the writer's opinion, the most satisfactory, mainly on account of its simplicity.

Preparation of the Bath

On repeat shades little difficulty is experienced in matching, but with new shades the task is not a simple one. Unnecessary time should not be lost after preparing the bath, for fear of oxidation occurring. In this connection, however, the use of sodium sulphide proves its real worth.

It is advisable to reduce the dye in a relatively small volume of water at a temperature a few degrees higher than the dyeing temperature. When this has cooled to the correct temperature it can then be poured into the tank.

The patch is struck off in the usual manner, care being taken to observe the same rules of procedure with the sample as intended for the batch. If additions are necessary, the added dye can be mixed with some of the dye liquor, which contains enough excess hydrosulphide for reduction.

Successful work can be done with speeds ranging between 120 and 160 yards per minute. A "batcher" on the back of the pad may be used, but this is unnecessary; furthermore, the goods are drawing through the soapers a great deal easier from a box truck than from a roll. Immediate soaping in a rope soaper is to be recommended as a precaution against possible "box marks." It has been estimated that between 20 and 25 per cent of the color is removed during soaping.

Since the cost of dye in vat dyeing is the largest expense, some estimation of the complete dyeing cost may be gained from a consideration of the fact that pinks, blues, orchids, honeydews, etc., cost from three-

quarters to one cent per yard for the dye. It is thus easy to perceive why this method should meet with favor of all interested in the wark.

This method of procedure is the result of extensive experimental work on the part of the chemist and dyer, and while not entirely free from objections, is satisfactory. Light, medium or heavy shades can be obtained on practically any weight of goods within certain reasonable limits.

(To be continued.)

Effects of Treating Materials and Outdoor Exposure Upon Water Resistance and Tensile Strength of Cotton Duck[1]

Waterproofing Materials Frequently Promote Deterioration in the Strength of Canvas Exposed to the Weather—In General, the Addition of Pigments to Waterproofing Preparations Is Beneficial, As They Reduce the Deterioration Effects of Sunlight Without Interfering with Water Resistance

By T. D. JARRELL and H. P. HOLMAN

Bureau of Chemistry, Washington, D. C.

A DECIDED deterioration in the strength of canvas which could not be attributed to mildew or bacterial decay was frequently observed in an investigation on the effects of continuous exposure to the weather upon the water resistance of treated canvas.[2] This occurred when drying oils, which are commonly believed to "rot" canvas, were used and also when the canvas had been treated with materials ordinarily considered inert. Accordingly, a study was made of the effects which waterproofing materials have upon the tensile strength of cotton yarn when exposed to the weather. One of the most striking facts thus shown[3] was that the addition of burnt umber to a drying-oil treatment had a marked preservative effect upon the strength of the treated and exposed yarn. This suggested the possibility that pigments, when added to the waterproofing formulas developed in the laboratory, might reduce the injurious effects of the treatments upon the strength of cotton duck exposed to the weather. Further investigations were therefore started. Cotton duck was used, as the effects of treating materials upon yarn are not strictly applicable to woven fabrics.

In the investigations reported herein particular attention was given to a comparison of two waterproofing treatments, which in previous tests had caused rapid deterioration of canvas, with treatments which were identical therewith except that they contained mineral pigments. Twenty-three pigments, including two asphalts, were used.

The effect of pigments in protecting fabrics from deterioration by sunlight has received some attention from previous investigators. In discussing the deterioration of doped aeroplane fabrics, Turner[4] states that it was observed early in the late war "that where paint was used on the doped fabric, such as for identification circles on the wings, the fabric had not deteriorated nearly so much as at the unpainted parts." Turner, however, did not present any comparative data. Furthermore, Perott and Plumb[5] state that "as high as 20 per cent of carbon tends to preserve the fabric (rubber gas mask), especially when exposed to sunlight." This statement, however, was based on the performance of a single sample.

The use of pigments for protecting fabrics against the deteriorating effect of sunlight is covered, to same extent, in a patent granted to Gardner.[6] In his specification the patentee states that he may "add to the ammonium phosphate solution (used to fireproof the fabric) from 2 to 10 per cent by weight of a pigment such as red iron oxide or carbon black; the purpose being to stop the light rays which affect the strength of the fabric. In this patent the use of one or more coats of dope containing aluminum powder is also specified, since, "due to the high light-reflecting surface of the fabric, the cloth remains strong for a long period of time." The exposure tests here described, however, had been begun a month before the granting of this patent, and they were completed before the patent came to the authors' attention.

The straight waterproofing treatments included the four formulas recommended in Farmers' Bulletin 1157 (one slightly modified) and four of the eighteen formulas used in the weather-exposure tests reported by Veitch and Jarrell,[2] as well as several others developed in the laboratory. While they are called straight waterproofing treatments to distinguish them from those to which pigment was added, several of them, those containing asphalt or pitch, might be said to contain pigment, the asphalt and pitch having a tendency to color the fabric and shut out the light. Three commercial preparations, none of which contained pigment, were used for comparison with the treatments developed in the laboratory. These commercial treatments were used in the condition in which they were received and according to the directions accompanying them.

[1] Presented before the Division of Industrial and Engineering Chemistry at the sixty-fourth meeting of the American Chemical Society, Pittsburgh, Pa

[2] Ind. & Eng. Chem., **13** (1921), 672

[3] Ind. & Eng. Chem., **15** (1923), 236.

[4] J. Soc. Dyers Colourists, **36** (1920), 165.

[5] Ind. & Eng. Chem., **11** (1919), 443.

[6] U. S. Patent 1,381,413 (June 14, 1921).

Experimental

The solid treating materials were weighed out in the proper proportions, mixed, melted, and poured into the solvent. When raw linseed oil, boiled linseed oil, or boiled linseed oil and pigment were used, no solvent was added. Pigment was added at the rate of one pound to one gallon of the prepared solution, except in the case of Treatment A-15, in which the rate was one-half pound per gallon.

Twelve-ounce, gray, United States standard army duck,[7] cut from the same bolt into 15 by 28.5 inch sections, was used for all treatments. The treatments were applied with an ordinary 2.5-inch paint brush and to only one side of the canvas, with the exception of Treatment 20 in Table I, which was applied to both sides. All treatments containing beeswax or paraffin were warmed slightly just before they were applied to the canvas, and all solutions containing suspended matter were kept thoroughly stirred during application.

Four untreated sections and four sections, to which one of the base treatments used in determining the effects of pigments (Treatment 6 in Table I or A in Table II) was applied, were used as controls.

After applying the treatments and allowing them to dry, each section was cut crosswise into two pieces, one 16 inches wide and the other 12.5 inches wide. The narrower pieces were kept in the laboratory, while the wider ones were used in the exposure tests. The wider pieces securely attached to 12-inch boards, with their edges on the under side, were exposed to the weather in the open country near Washington, D. C., continuously from May 15 to November 15, 1921. The boards on which the pieces of canvas were placed were laid flat on trestles, so that the material would be exposed to the rays of the sun throughout the day. At the end of six months the pieces were detached from the boards, brought to the laboratory, dried overnight in an electric oven at 45 deg. Cent., and then tested for their comparative water resistance by the modified funnel test,[8] being rated on a basis of 10. The funnel test was repeated on all pieces from one to three times and the ratings were averaged. Many of the pieces were also tested by the modified spray test.

After the laboratory tests for water resistance of the exposed samples were completed, the same pieces were used for tensile-strength tests by cutting each into five strips, 8 inches long in the warp direction and 1¼ inches wide, and then pulling out the warp yarn from both sides of the narrow strips until forty-six threads, equivalent to a width of one inch in the original canvas, remained. They were then placed in the constant-temperature and humidity room and allowed to condition at 65 per cent relative humidity and 70 deg. Fahr. The tensile strength was determined at this condition by means of a standard type of tensile-strength tester. The results recorded in the tables are an average of five breaks in every case. The effect of th treatments upon the tensile strength of the exposed duck is expressed as percentage gain or loss, calculated from the tensile strengths of the treated and exposed untreated samples as the basis of comparison.

Table I includes all the laboratory treatments which contained no pigments (other than asphalt or pitch). Table II includes the treatments to which pigments were added, as well as the base treatments without the pigments. Table III gives the results obtained with the three commercial treatments.

The weight of the duck was increased 25 to 30 per cent by all treatments in Table I, except those with raw and boiled linseed oils and Treatment 20. In Treatment 20 the weight of the canvas was increased about 38 per cent, and would have been more but for the fact that the second application was made before the first had become dry. With linseed oils (Treatments 27 and 28) the weight was increased 60 to 65 per cent. The increase in weight from treatments in Table II containing pigments was 35 to 45 per cent, except in the linseed-oil treatments. When pigments were added to boiled linseed oil, the increase ranged from 70 to 80 per cent, except in Treatment D-3, where it was only about 45 per cent. The linseed oil did not penetrate the cloth in this case because a soap solution had been applied to the canvas just before treating it.

Discussion of Results

With all the treatments in Table I, none of which contained pigments other than asphalt or pitch, the tensile strength of the treated canvas after exposure was lower than that of the untreated canvas after exposure, and in many cases the deterioration was great.

This general result differs strikingly from that obtained in the previous experiments with yarn,[8] the treated samples of which in most cases showed a greater tensile strength after one year's exposure than did the untreated yarn after exposure. The reasons for this difference are not perfectly clear. Probably, however, the different method of exposure, resulting in subjection of the canvas to much higher temperatures than the yarn, and the different method of applying the treatments are important factors.

Canvas subjected to treatments consisting of a mixture of 85 per cent mineral wax (Treatments 1, 5, 6, and 8) and 15 per cent of beeswax and that subjected to raw linseed-oil treatments showed decided deterioration, being from 63 to 84 per cent weaker than the untreated canvas after exposure. Yellow petrolatum apparently had a greater deteriorating effect than any other material used. When petroleum asphalt was substituted for beeswax in Treatment 5, a somewhat higher tensile strength was obtained, and as the quantity of asphalt was increased and that of the petrolatum decreased proportionately, the tensile strength increased. When coal-tar pitch was substituted for petroleum asphalt, there was a somewhat greater increase in strength. When lead oleate was sub-

[7] Count: warp 46, filling 34; ply: warp 3, filling 4.
[8] Ind. & Eng. Chem., **12** (1920), 26.

TABLE I—*Water Resistance and Tensile Strength of Cotton Duck Subjected to Laboratory Waterproofing Treatments, Without Pigments, and Exposed to the Weather for Six Months*

Treatment	Treating Materials [a]	Proportion Used	Water Resistance After Exposure: Funnel Test Rating	Water Resistance After Exposure: Spray Test Rating	Tensile Strength After Exposure (1-In. Warp), Kg.	Variation from Strength of Untreated After Exposure, Per Cent	Tensile Strength of Unexposed Canvas [b], Kg.
0.	Untreated control, 12 oz., gray, U. S. standard army duck	....	0	0	38	..	62
1.	Amorphous mineral wax and beeswax	85:15	5	8	14	—63	..
2.	Amorphous mineral wax, lead oleate, and beeswax	65:20:15	8	10	17	—55	..
3.	Amorphous mineral wax, copper oleate, and beeswax	65:20:15	1	9	23	—39	..
4.	Amorphous mineral wax, calcium oleate, and beeswax	65:20:15	6	8	12	—68	..
5.	Dark petrolatum and beeswax	85:15	6	6	12	—68	..
6.	Yellow petrolatum and beeswax	85:15	2	6	6	—84	55
7.	Treatment 6 and boiled linseed oil	1 gal. 0.5 gal.	3	9	11	—71	..
8.	Soft paraffin (scale wax) and beeswax	85:15	9	9	12	—68	..
9.	Soft paraffin (scale wax), beeswax, and Bermudez asphalt	60:15:25	9	10	17	—55	..
10.	Neutral wool grease and petroleum asphalt	25:75	10	..	25	—34	..
11.	Extracted wool grease and petroleum asphalt	25:75	9	10	20	—47	..
12.	Extracted wool grease, lead oleate, and petroleum asphalt	25:15:60	9	10	23	—39	..
13.	Extracted wool grease, lead oleate, and coal-tar pitch [c]	25:15:60	10	..	30	—21	..
14.	Dark petrolatum and petroleum asphalt	85:15	9	..	16	—58	..
15.	Dark petrolatum and petroleum asphalt	60:40	10	..	19	—50	..
16.	Dark petrolatum and petroleum asphalt	25:75	10	10	21	—45	..
17.	Dark petrolatum, lead oleate, and petroleum asphalt	25:15:60	9	..	22	—42	..
18.	Yellow petrolatum and coal-tar pitch [c] LL	25:75	9	10	29	—24	58
19.	Yellow petrolatum and petroleum asphalt	25:75	10	10	25	—34	58
20.	Yellow petrolatum and petroleum asphalt [d]	25:75	10	..	21	—45	63
21.	Yellow petrolatum, lead oleate, and petroleum asphalt	25:15:60	10	..	27	—29	60
22.	Yellow petrolatum, copper oleate, and petroleum asphalt	25:15:60	10	..	30	—21	58
23.	Dark petrolatum, beeswax, and petroleum asphalt	75:10:15	9	..	17	—55	60
24.	Yellow petrolatum, beeswax, and petroleum asphalt	30:10:60	10	..	23	—39	59
25.	Soft paraffin (scale wax)	....	0	9	12	—68	58
26.	Beeswax	....	10	10	25	—34	58
27.	Raw linseed oil (commercial) (no solvent used)	....	[e]	..	14	—63	58
27a.	Raw linseed oil (authentic) [f] (no solvent used)	....	[e]	..	13	—66	56
28.	Boiled linseed oil (commercial) (no solvent used)	....	8 [g]	9	22	—42	62
28a.	Boiled linseed oil (commercial kettle boiled) [h] (no solvent used)	....	9 [g]	..	17	—55	55

[a] All treatments, except as noted, were applied in a mixture of gasoline and kerosene (3 to 2 by volume), using 2 lbs. per gal.

[b] Tests made on portion of treated canvas kept in the laboratory, well protected from light, for the same length of time as the other portions were exposed. Tests not made on all samples because representative treatments showed little deterioration.

[c] In coal-tar naphtha; 2 lbs. per gal.

[d] Applied to both sides of duck.

[e] The water dripped because the cloth broke upon folding.

[f] Made in Bureau of Chemistry from Indian flaxseed.

[g] Result of first test; upon repeating, the water dripped through rapidly, owing to a break in the coating.

[h] Claimed to be kettle boiled for 8 hrs. in presence of burnt Turkey umber, red lead and litharge.

stituted for a portion of the amorphous mineral wax in Treatment 1, the strength was slightly increased, and the substitution of copper oleate for lead oleate caused a still greater increase in strength.

Dark petrolatum and amorphous mineral wax[9] have practically the same water-resistant qualities when 15 per cent of beeswax is mixed with them. Yellow petrolatum, which has a lower melting point and less viscosity than dark petrolatum, gave a much lower water-resistance rating when mixed with the asme amount of beeswax than did the other two petroleum "greases." When an excess of asphalt (75 per cent) was combined with either dark or yellow petrolatum, the water-resistance ratings were the same, being increased to 10 in each case. The substitution of 20 per cent of lead oleate for the same amount of amorphous mineral wax in Treatment 1 increased the water resistance. Neither copper nor calcium oleate (20 per cent) was as effective from a waterproofing standpoint as lead oleate in formulas containing no asphalt.

[9] Amorphous mineral wax resembles dark petrolatum. It has, however, a higher melting point and is more viscous.

Apparently, there was no difference in water resistance when an excess of asphalt (60 per cent) was used. A noteworthy point in connection with these results is that whenever petroleum asphalt or coal-tar pitch was included in the preparations, the water-resistance ratings were high. Other experiments have shown that natural refined asphalts give similar results. Of the four materials used alone, beeswax gave the highest water-resistance rating (10).

Table II shows that pigments, when added to waterproofing treatments which are known to have injurious effects on canvas exposed to the weather, materially reduce such effects. In fact, many of the pigments used had a preservative effect, the strength of the treated fabric after exposure being greater than that of the untreated canvas after exposure. This effect of pigments in retarding the deterioration of waterproofed canvas exposed to the weather undoubtedly is due to the fact that they form a coating on the surface of the fabric, which tends to shut out the light. A somewhat similar effect is obtained by the use of bituminous materials. This might explain why treatment with preparations con-

TABLE II—*Water Resistance and Tensile Strength of Cotton Duck Subjected to Laboratory Waterproofing Treatments, With and Without the Addition of Pigments, and Exposed to the Weather for Six Months*

Treatment	Treating Materials [a]	Water Resistance After Exposure: Funnel Test Rating	Water Resistance After Exposure: Spray Test Rating	Tensile Strength After Exposure (1-In. Warp), Kg.	Variation from Strength of Untreated After Exposure, Per Cent	Increase Over Strength Obtained with Base Formula After Exposure, Times as Strong	Tensile Strength of Unexposed Canvas [b], Kg.
0.	Untreated control, 12 oz., gray, U. S. standard army duck	0	0	38	..	...	62
A	Yellow petrolatum and beeswax (No. 6, Table I)	2	6	6	—84	...	55
A 1.	Treatment A and dry yellow ochre	9	..	40	+ 5	6.7	62
A 2.	Treatment A and yellow ochre gr. in linseed oil	9	..	49	+29	8.2	59
A 3.	Treatment A and dry Indian red	6	8	26	—32	4.3	..
A 4.	Treatment A and Indian red gr. in linseed oil	9	..	31	—18	5.2	..
A 5.	Treatment A and dry Venetian red	9	..	31	—18	5.2	..
A 6.	Treatment A and Venetian red gr. in linseed oil	7	9	37	— 3	6.2	..
A 7.	Treatment A and dry burnt sienna	9	..	43	+13	7.2	58
A 8.	Treatment A and burnt sienna gr. in linseed oil	9	..	39	+ 3	6.5	56
A 9.	Treatment A and dry raw sienna	9	..	48	+26	8.0	59
A 10.	Treatment A and raw sienna gr. in linseed oil	9	..	38	0	6.3	59
A 11.	Treatment A and dry burnt umber	[c]	..	50	+32	8.3	59
A 12.	Treatment A and burnt umber gr. in linseed oil	8	10	39	+ 3	6.5	55
A 13.	Treatment A and dry raw umber	9	..	43	+13	7.2	54
A 14.	Treatment A and raw umber gr. in linseed oil	8	..	41	+ 8	6.8	60
A 15.	Treatment A and dry Prussian blue	10	..	35	— 8	5.8	..
A 16.	Treatment A and dry dark chrome green	9	..	33	—13	5.5	..
A 17.	Treatment A and dry artificial malachite green	10	..	39	+ 3	6.5	..
A 18.	Treatment A and dry red lead	9	..	32	—16	5.3	..
A 19.	Treatment A and dry chrome yellow	8	..	18	—53	3.0	..
A 20.	Treatment A and dry lampblack	2	6	47	+24	7.8	..

A 21.	Treatment A and Bermudez asphalt	10	..	21	—45	3.5	..
A 22.	Treatment A and petroleum asphalt	9	..	16	—58	2.7	..
A 23.	Treatment A and dry zinc oxide	8	..	32	—16	5.3	..
A 24.	Treatment A and dry white lead	9	10	20	—47	3.3	..
A 25.	Treatment A and whiting	0	2	27	—29	4.5	..
A 26.	Treatment A and barytes	2	7	10	—74	1.7	..
A 27.	Treatment A and kaolin	2	8	11	—71	1.8	..
A 28.	Treatment A and dry lithopone	0	8	11	—71	1.8	..
B	Yellow petrolatum, copper oleate, and petroleum asphalt (No. 22 in Table I)	10	..	30	—21	...	58
B 1.	Treatment B and dry burnt umber	10	..	52	+37	1.7	59
C	Yellow petrolatum, beeswax, and petroleum asphalt (No. 24 in Table I)	10	..	23	—39	...	59
C 1.	Treatment C and dry burnt umber	10	..	50	+32	2.2	57
D	Boiled linseed oil, commercial (No. 28, Table I)	8[d]	9	22	—42	...	62
D 1.	Treatment D and dry yellow ochre	9	10	40	+ 5	1.8	59
D 2.	Treatment D 1 with Japan drier in turpentine (1 pt. to gal.)	9	..	41	+ 8	1.9	62
D 3.	Treatment D 2, applied after brushing sol. of soft soap on canvas[e]	0	2	30	—21	1.4	55
D 4.	Treatment D and dry Indian red	7	..	37	— 3	1.7	58
D 5.	Treatment D and dry Venetian red	9	..	36	— 5	1.6	..
D 6.	Treatment D and dry burnt sienna	9	..	36	— 5	1.6	..
D 7.	Treatment D and dry raw sienna	9	..	37	— 3	1.7	..
D 8.	Treatment D and dry burnt umber	9	10	33	—13	1.5	..
D 9.	Treatment D and dry raw umber	9	10	42	+11	1.9	..
D 10.	Treatment D and dry lampblack	10	..	54	+42	2.4	..
D 11.	Treatment D and dry zinc oxide	8	..	58	+53	2.6	..
D 12.	Treatment D and dry white lead	9	10	29	—24	1.3	..
D 13.	Treatment D and dry kaolin	9	..	40	+ 5	1.8	..
D 14.	Treatment D and dry aluminum bronzing powder	9	..	51	+34	2.3	..
D 15.	Treatment D and dry flake graphite	9	..	41	+ 8	1.9	..
D 16.	Treatment D and dry Prussian blue	9	..	39	+ 3	1.8	..

[a] Where pigment was used, it was added to the waterproofing mixture at the rate of 1 lb. per gal. in every case, except A-15, in which pigment at the rate of 0.5 lb. per gal. was used.

[b] Tests made on portions of treated canvas kept in the laboratory, well protected from light, for the same length of time as the other portions were exposed. Tests not made on all samples because representative treatments showed little deterioration.

[c] Water-resistance test omitted because of defect in sample.

[d] Result of first test: upon repeating, the water dripped through rapidly, owing to a break in the coating.

[e] This treatment was prepared and applied as directed in Circular 24, issued September 15, 1919, by the Motor Transport Corps of the War Department.

taining an excess (over 50 per cent) of asphalt or pitch usually left the canvas stronger after exposure than when it was subjected to other treatments listed in Table I. The fact that the treatments containing coal-tar pitch gave higher results than similar treatments containing petroleum asphalt was probably due to the darker surface coating obtained in the case of the pitch. An inspection of the canvas indicated that the petroleum asphalt, being more completely dissolved, had penetrated the fabric, leaving less color on the surface.

Canvas subjected to the base treatment of petrolatum and beeswax (Treatment A) with the addition of various pigments was, after exposure, from 1.7 to 8.3 times as strong as canvas subjected to the base treatment alone. No great significance can be attached to the fact that two samples of apparently the same pigment, in one case dry and in the other case ground in oil, differ with respect to effectiveness in preserving the strength of the treated canvas. Aside from the possible effect of linseed oil, the pigment in two different samples might vary in chemical composition and physical properties.

As a result of adding pigments to the linseed-oil treatment (Treatment D), six months' exposure caused less reduction in tensile strength of the treated canvas than was shown by exposed canvas treated with the oil alone. This was true in every case, the strength after exposure being from 1.3 to 2.6 times as great as the strength of the canvas treated with boiled linseed oil without pigment.

The addition of pigments to yellow petrolatum and beeswax resulted in increased water-resistance ratings. The addition of burnt umber to two preparations containing an excess of asphalt and having very high water-resistance ratings did not affect their ratings. The addition of pigments to commercial boiled linseed oil had the

(*Concluded on page 537.*)

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

LAURANCE T. CLARK
Managing Editor

Published biweekly by
HOWES PUBLISHING CO., INC.
4109 Woolworth Building, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XII July 16, 1923 No. 15

JUDICIAL VAGARIES

IF some of the recent decisions in dye import cases handed down in the General Appraiser's Court are any indication, reversals are going to be numerous and the administration of the existing tariff act rendered doubly difficult.

In the case of Benzo Red 12B (Kuttroff Pickhardt) *vs.* Pontamine Fast Pink G (Du Pont), Judge Brown's decision establishes the point that when, as was the case cited above, the imported dye is three and one-half times stronger than the competing domestic dye, the basis for calculating the duty shall be on the American selling price of the domestic product, and that the difference in strength between the two products shall be disregarded.

Just how this learned jurist reconciles such a decision with either the spirit or letter of the law is beyond the ken of experts in the dye field. As an example of what would take place were this rule pushed to its logical conclusion, let it be supposed that an American and a foreign manufacturer each make a product of a certain strength which the American sells here for $1 a pound. If the American were then to market his product in twenty times as high a concentration, and at a proportionate price, the consumer who used the imported product would then have to pay duty assessed on a valuation of $20 for a dollar-a-pound article. There are many who believe this ruling will be changed by the Board of General Appraisers. There is no doubt but that it should be changed, and speedily.

Again, in the case of Azo Flavine (Kuttroff Pickhardt) *vs.* Azo Yellow (National), Judge Brown ruled that the burden of proof rests upon the U. S. Government in all cases. In other words, all the dye importer has to do is to declare that he knows of no competitive product—and let the Government go through all the work of searching the field, preparing its case and then going into court with it.

From the foregoing it is apparently none too certain that the rendering of decisions in these dye cases is at present in the most competent hands imaginable. A string of appeals is just so much time wasted; it is expected of the court that the majority of its decisions shall stand far more than the merely casual examination required to detect the fallacies outlined above, and it would appear the better plan to make reasonably certain of settlements on first trials.

At all events, the forthcoming decisions on some of the cases listed in this issue of The REPORTER, as well as the cases noted for the September docket, are going to be scanned with more than usual interest.

THE UNFOUNDED CHARGES AGAINST HERMAN A. METZ

WHILE many interesting developments have taken place in the suit of the Government to recover the patents now held by the Chemical Foundation, none has been more sensational, nor attracted more attention from the public press, than the attempt by counsel for the defendant to imply that Herman A. Metz has been the "invisible plaintiff" in the suit and had, in fact, instigated the Government's action. Startling as this was, however, the sensation primarily arose from the methods employed, which consisted principally in exceptionally virulent attacks on the witness's character, integrity and loyalty, and culminated with an attempt to show that Mr. Metz's firm had sold "poisonous" salvarsan to the Government during the war, causing the death of American soldiers and sailors.

We have every confidence that the absurdity of a charge of this character will be wholly obvious to readers of The REPORTER. Quite apart from the fact that an unspeakable and unwarranted insult has been offered, the allegation is not even sensible. It does not "add up right" from any standpoint. Puerility can go little further.

There has never been any mistake about the attitude of The REPORTER in the past, nor can there be any mistake in the present case. We are concerned with the interests and rights of the American dye industry, and we have consistently taken the stand that those rights are genuine enough and important enough to dye consumers and to the country at large to comand due consideration on their intrinsic merits. We have never been disabused of the certainty that in any controversy between the industry and others, a frank statement of all the facts by both sides is sufficient to effect an adjustment fair to everyone. We know the industry to be so sound and so necessary that it cannot at any time be damaged by the truth about it. It is unnecessary for it to employ "slick" methods to gain simple justice.

It is in the interests of the industry, then, as well as those of Mr. Metz, that we refer to his case here. We are well aware that in legal practice an attack upon

the creditability of a witness by a trial lawyer is legitimate, but it is also recognized that when such witness is actually innocent of the charges made against him and can vindicate himself, yet is obliged to stand for having the charges published broadcast in the newspapers twenty-four hours in advance of his vindication, irreparable injury may be done him—injury for which the victim has no redress.

Such an injury in the present trial resulted to Mr. Metz, who was victimized first by the published charges of Isidor J. Kresel, counsel for the defense, and later by the carelessness of the Wilmington Morning News.

The retraction printed by that newspaper will be found among the advertising columns of this issue, and should be read by all who have been interested in this case. But even at best, a retraction is poor amends for misrepresentation; for a sensational story quickly gains currency and many who hear it never encounter the retraction, and there are some upon whom even the retraction has little effect; in their minds there is doubt about the victim's character forever after.

When unfounded charges are published, the press at large, whether directly concerned or not, as a matter of principle owes it to the victim to see that the vindication gets as much prominence as possible, and since we are a publication with space at our command, we believe most heartily in doing our bit, particularly when the case lies so close to the industry which we serve.

We did not publish the salvarsan charges against Mr. Metz, but we take great pleasure in publishing his statement in which he quoted Dr. G. W. McCoy, director of the Hygienic Laboratory of the U. S. Public Health Service, in a flat denial of Mr. Kressel's charges.

Mr. Metz states that Dr. McCoy has investigated all the cases of deaths attributed to the use of salvarsan since the drug has been made in this country, and has found that none of them could be laid to the drug itself. According to Mr. Metz, the Government has found that every death was due to some peculiar condition of the patient, to carelessness of the physician who examined the patient, or to improper handling of the drug by the physician who administered it.

According to Mr. Metz, Dr. McCoy has verified his contention that all the salvarsan sold to the Government by the Metz company, the largest manufacturer of the drug in America, passed the Government tests. In cases where patients have died after receiving salvarsan treatment, Mr. Metz states that both he and Dr. McCoy have checked up on other patients treated with doses from the same shipment, and have found they had suffered no adverse results.

Mr. Metz emphasizes that salvarsan contains a large quantity of arsenic, and that some patients react adversely after receiving an injection of salvarsan because they have an idiosyncrasy against arsenic. He explains that the situation is the same as in the use of novocain, which is used successfully and safely in thousands of cases as a local anaesthetic, but sometimes causes severe reactions, even death, in persons who have an idiosyncrasy.

Mr. Metz further states—and this alone should be sufficient refutation of charges—that without exception all other complaints against salvarsan personally investigated by him have been found to have arisen from something other than the drug itself. As an example, in the case of a well-known New York City hospital where complaint was made that ten men treated with salvarsan in one night all developed reactions, it was shown upon investigation that the fault occurred in the sodium hydroxide used, which was insufficient to neutralize the salvarsan and also contained sodium carbonate, which produces unfavorable results when injected.

Upon such contingencies entirely beyond his control, then, may rest the reputation of a drug manufacturer. It would be as logical to hold Messrs. Merck or Squibb accountable for errors in compounding prescriptions by druggists, or the Winchester Arms people responsible for injuries due to the careless handling of weapons.

The REPORTER has frequently differed widely with Mr. Metz's views; the long struggle over the dye import question has often found us on opposite sides of the fence. But at all times the truth and nothing but the truth has been our goal, for the truth can never hurt the industry which we serve. This being the case, we desire to state that personal animosity, and vilification of Mr. Metz, are entirely uncalled for and unwarranted, and that, while Mr. Kresel may have been sincere in his endeavors, he showed poor judgment in attacking him with charges so ill-founded that we verily believe they would be thrown out of any court in which a prosecution on them was attempted.

The Chemical Foundation has a perfectly valid case and should win the suit now going forward at Wilmington. It has no need to make use of such tactics to establish its soundness and its legal rights.

SAYS AMERICA MUST PRODUCE ORIGINAL COLORS

Althouse Now Offering Several Unlike Any Known Pre-War Types

One of the criticisms most frequently made of the American dyestuff industry in its present state of development is that its research has not been along original lines, but has been chiefly in the direction of reproducing colors which were known and used before the war. Many of these colors had even been superseded by others of greater brilliancy or fastness and had almost passed into disuse prior to 1914.

To a certain extent this criticism had been justified although it should be remembered that when this country found itself confronted with a complete dislocation of its usual sources of supply the early efforts were necessarily in the direction of what was known and could be produced with the least possible delay.

Sufficient time has elapsed, however, and sufficient

chemical experience has been gained to warrant the expectation of those who are looking to the industry to produce new colors—colors which are not merely copies of what has been done before, but which possess new structure and qualities specially designed to meet the requirements of the textile and other color-using industries of this country.

The possibilities in the manipulation of coal-tar derivatives have not, by any means, been exhausted, and if the American dyestuff industry is to hold its own when normal conditions are restored in the industrial world—as they will be restored before many more years have passed—it must be prepared to lead, rather than follow, in the production of new and improved dyes and processes of dyeing.

It is along these lines that the Althouse Chemical Company is proceeding, and it is now offering several colors which do not correspond to any known pre-war types.

Its two Silk Browns, G and R, and its Azanol Scarlet R have no corresponding Schultz numbers, and possess qualities which are unique, either for shading or as self-colors.

They are exceedingly fast to light, and produce a wide line of popular fashion shades when used in conjunction with other well-known dyes. They have unusual level dyeing properties and high tinctorial value. While the above browns are described as Silk Browns, they are equally useful on wool, either in raw stock, yarn or piece dyeing.

Decision on Italian Dye Tariff Still Hangs Fire

Lack of Quorum Prevents Action at Termination of Chamber Meetings—Under-Commission Appointed to Consider Suggestions—Other Changes Proposed—Color Firms Prominent Among Exhibitors at Trade Exposition

Genoa, June 25, 1923.
Special to THE REPORTER.

DURING a recent trade exposition held at Padova one of the most successful booths was that of the Societa Anonima Colori, Vernici ed Affini, of Padova, other booths of important producers of colors of all sorts were also noted.

As a consequence of the discussions that took place in the Italian Chamber regarding the modifications to be introduced in the customs tariffs, an under-commission of mixed parliament people and functionaries was named to make definite proposals after nineteen suggested plans had been received and considered.

Here, on June 14, such plans were discussed, but nothing concrete could be decided regarding dyestuffs and it was determined to make investigations in the textile industry, and especially in the wool industry and cotton industry, which last is now facing a crisis through overproduction.

After this the examination of the customs tariffs has continued in several other meetings, and a certain number of proposals have been made. In a midday sitting the examination of the customs tariffs was brought, however, to an end, but owing to the lack of a quorum no action could be approved. Regarding the importation tariffs practically no modifications seem to have been introduced. All the exportation customs arranged were approved without much discussion.

The under-commission proposed an increase in the customs tariffs for raw nitro-benzol, aniline and toluydine, and for aniline salt and unnamed aniline salts and derivatives, bringing from 0.5 to 1 the coefficient of majoration on the same; and a reduction in the customs on raw glycerine, bringing this from 8 to 5, and on refined glycerine from $10+1$ to $8+1$. No reductions were instituted for terpenes from essential oils, boric acid, synthetic colors, etc.

The Italian production of acetic acid from July, 1922, to January, 1923, reached 540 tons, and its consumption 349 tons, this product being supplanted to a very extensive degree in wool dyeing by sulphuric acid, for economic reasons. The Italian production of glucose during the same period, reached 3,330 tons, and its consumption 3,679 tons. The production of soap was 75,326 tons and its consumption 74,724 tons.

At a recent congress of applied chemistry held in Rome, Gualtiero Poma spoke on the Italian coloring matter industry, and on the new processes for the production of the most important intermediate products demonstrating that a similar industry can very well exist in Italy and can realize development despite the lack of raw materials and the limitations of the national market. He stated also that at present Italy produces more than half the colors used.

During a meeting of the Istituto Internazionale pei Finanziamenti Esteri in Italia, it was proposed to establish a bank for foreign investments, but the idea did not meet the approval of those present, it being the aim of the institution to make every effort for attracting the participation of foreign capital in the Italian industries. Senator Dante Ferraris stated that if so far little help had been obtained in this direction, especially on the part

TABLE I

	May 10		June 25	
	(lire)	(dollars)	(lire)	(dollars)
Naphthol Yellow	40,000—65,000	1,904—3,095	40,000—65,000	1,818—2,954
Auramine	60,000—70,000	2,857—3,333	60,000—70,000	2,727—3,181
Orange II	20,000—22,000	952—1,047	20,000—22,000	909—1,000
Nigrosine, water soluble	28,000—35,000	1,333—1,666	28,000—35,000	1,272—1,590
Nigrosine, soluble in alcohol	30,000—38,000	1,428—1,809	30,000—38,000	1,363—1,727
Sulphur Black	7,000—11,000	333— 523	7,000—11,000	318— 500
Acid Black	24,000—28,000	1,142—1,333	22,000—25,000	1,000—1,136
Direct Black	24,000—29,000	1,142—1,380	22,000—26,000	1,000—1,181
Chrome Black	28,000—32,000	1,333—1,523	25,000—30,000	1,136—1,363
Methylene Blue	75,000—90,000	3,571—4,285	75,000—90,000	3,409—4,090
Direct Blue	20,000—25,000	952—1,190	19,000—23,000	863—1,045
Sulphur Blue	20,000—25,000	952—1,190	20,000—23,000	909—1,045
Malachite Green	75,000—90,000	3,571—4,285	75,000—90,000	3,409—4,090
Acid Green	60,000—70,000	2,857—3,333	60,000—70,000	2,727—3,181
Direct Green	30,000—35,000	1,428—1,666	28,000—32,000	1,272—1,454
Bismarck Brown	30,000—35,000	1,428—1,666	28,000—34,000	1,272—1,545
Magenta (Fuchsine) Crystals	70,000—80,000	3,333—3,809	70,000—80,000	3,181—3,636
Eosine	50,000—75,000	2,380—3,571	50,000—75,000	2,272—3,409
Ponceaux	25,000—30,000	1,190—1,428	25,000—32,000	1,136—1,454
Methyl Violet	65,000—80,000	3,095—3,809	65,000—80,000	2,954—3,636

of the United States, this was due mostly to the lack of initiative shown on the part of the Italians themselves, and not for any other reason.

During an assembly of the owners of the Colorificio Italiano Bleu Oltremare it was decided to increase the capital from 500,000 lire to 1,250,000 lire, through the issue of new shares of 100 lire, to be distributed to the old shareholders in the proportion of three new shares to every two held.

Dyestuff Imports and Exports

The total imports of synthetic coloring matters reached during 1922 a total of 2,488 tons. Of these 1,549 tons came from Germany through private channels, only 756 tons coming from Germany on account of war reparation; 162 tons from Switzerland, and the rest from the United States and other countries. The exports of such colors reached 169 tons, being 17½ tons of sulphur colors, 144½ tons of synthetic coloring matters without water and with water up to 50 per cent, and seven tons of such last colors with 50 per cent and more of water, of which 14½ tons were sulphur colors on account of war reparation, and 630 tons other colors on account of war reparation without water or with water up to 50 per cent. The imports of liquid color extracts reached in 1922 about 52½ tons, and that of the dry extracts 508 tons, whereas the exports reached in the case of the liquid color extracts 307 tons, and in the case of the solid 117 tons.

The quotations for war reparation dyes in Table I, per ton in lire and dollars, show the difference in the dollar and lira prices at the moment of writing, in comparison with the prices prevailing on May 10 (the dyes being delivered in kegs from 25 to 50).

Mordants, Assistants, Dyehouse Products

A strong demand for mercerized cotton fabrics was noted despite the presentation on the market of strong lots of cheap silk knitted goods, thus permitting a very substantial increase in the price of caustic soda. Foreign exporters could benefit by this situation by pushing their products in direct competition with the national product.

The demand for yellow and white dextrine was also good, whereas with sodium sulphide and copper sulphate the demand was lower than had been anticipated. With other chemicals the orders given were still in fair number.

Some of the arrivals of dyehouse chemicals were as follows during 1922: Liquid chlorine 1½ tons, arsenious acid 156 tons, hydrochloric acid 15 tons, sulphuric acid 21½ tons, caustic potash 863 tons, caustic soda 23,261 tons, ammonia 1,703 tons, carbonate of potash 481 tons, carbonate of soda, calcined, 299 tons, soda crystals 254 tons, chloride of ammonia 608 tons, bleaching powder 846 tons, chloride of calcium 955 tons, chlorates of potash and soda 243 tons, chromates and bichromates 229 tons, nitrite of soda 248 tons, permanganate of potash 27 tons, sulphate of alluminum 1,796 tons, copper sulphate 3,949 tons, sulphate of soda 12,328 tons, chrome alum 7½ tons, ordinary alum 15¾ tons, sodium sulphide 2,218 tons, sodium phosphate crystals 472 tons, hydrosulphites 254 tons, solid silicate of soda 3,197 tons, liquid silicate of soda 1,820 tons, perborates 14½ tons, peroxides 19 tons, ferrocyanides 92 tons, hydrogen peroxide

TABLE II

	May 10		June 25	
	(lire)	(dollars)	(lire)	(dollars)
Acetate of alumina	1,600	76	1,600	72
Chrome alum	3,500	166	3,500	159
Bichromate of potash	5,900	280	5,900	268
Ferrous sulphate	500	23	500	22
Carbonate of soda	750	36	750	42
Copper sulphate	2,350	111	2,250	102
Tartar emetic	12,000	571	12,000	545
Aniline oil	13,500	642	13,500	613
White refined glycerine	7,800	371	7,800	357
Glucose, 45 deg. Be	3,900	185	3,900	177
Hydrogen peroxide	2,100	100	2,100	95
Tannic acid, 60 per cent	20,000	952	20,000	909
Tartaric acid, crystals	13,500	642	13,500	613
Acetic acid, 30 per cent	2,500	119	2,500	113
Formic acid	8,500	404	8,500	386
Hydrochloric acid, 20-21 deg. Be	250	11	250	11
Lactic acid, 80 per cent	6,000	285	6,000	272
Alum	850	40	850	38
Ammonia, 22 deg. Be	1,850	88	1,850	84
Bisulphite of soda, 32 deg. Be	380	18	380	17
Chlorate of potash	3,000	142	2,900	131
Chloride of ammonia	3,700	176	3,000	136
Bleaching powder	900	42	900	40
Nitrite of soda	3,000	142	2,950	134
Yellow prussiate of potash	20,000	952	20,000	909
Yellow prussiate of soda	18,000	857	18,000	818
Caustic soda, 70/72	1,800	85	1,900	86
Silicate of soda, 140 deg. Tw	1,000	47	1,000	45
Sodium sulphide	2,700	127	2,550	115
Logwood extract	6,500	309	6,500	295
Hematine crystals	10,000	476	10,000	454
Yellow dextrine	3,000	142	3,400	154
White dextrine	3,000	142	3,350	152
Farina	2,300	109	2,300	104
Kordofan gum	8,000	380	8,000	363
Indigo, 25 per cent	22,000	1,047	22,000	1,000
Beta-naphthol	25,000	1,190	25,000	1,136
Industrial castor oil	5,900	280	5,900	268

104 tons, impure acetic acid 238 tons, benzoic acid 3 tons, formic acid 197 tons, raw lactic acid 24 tons, oxalic acid 152 tons, tannic acid 45 tons, raw glycerine 169 tons, acetone 1 ton, chloroform 17 tons, chlorides of methyl, ethyl and methylene 3 tons, carbon tetrachloride 368 tons, formaldehyde 276 tons, nitrobenzene 5 tons, raw aniline and toluydine 35 tons, aniline salt 20 tons, phenylene diamine one-half ton, derivatives of benzidine, toluydine, tolidine, dianisidine, xylidine, phenylenediamine, phenetidine, anisidine 5 tons, anthraquinone one-third ton, resorcine one ton, alpha and beta naphthol 18½ tons, derivatives of naphthol and naphthylamine 5 tons, etc.

The quotations for mordants, assistants and dyehouse products, per ton in lire and dollars, given in Table II, show the difference in the dollar and lire prices at the moment of writing, in comparison with the prices prevailing on May 10.

Private Dyehouse Quotations

Some private quotations for dyestuffs at Genoa were as follows per kilo, showing how these competed against the war reparation products: Direct black, 23 to 27 lire; nigrosine crystals, 20 to 26 lire; sulphur black, 7.20 to 10.75; chrome black in powder, 26 to 32 lire; acid black, 23 to 26 lire; direct green 29 to 32.50 lire; eosine, 51 to 75 lire; liquid fustic extract, 7 to 7.50 lire; logwood extract, 6.50 to 7.50 lire; hematine crystals, 10 to 12 lire.

TABLE III

	Per Ton		
	May 10 (Lire)	June 25 (Lire)	June 25 (Dollars)
Zinc white	3,500— 6,000	3,250— 5,750	147— 261
Lead white	4,000— 4,500	3,750— 4,250	170— 193
Chrome yellow	2,800—14,000	2,800—14,000	127— 636
Zinc yellow	13,000—13,500	13,000—13,500	590— 613
English red	1,000— 1,500	1,000— 1,500	45— 68
Red oixde of iron	1,500— 3,000	1,500— 2,500	68— 113
Iron minium	1,400— 2,000	1,250— 1,750	56— 79
Cinnabar	6,000—50,000	6,000—50,000	272—2,272
Lead minium	1,400— 3,800	1,400— 3,800	63— 172
Red and yellow earths	600— 900	600— 900	27— 40
Green earths	2,000— 2,500	2,000— 2,500	90— 113
Paris blues	4,000—30,000	4,000—35,000	181—1,590
Ultramarine blues	5,000— 12,000	5,000—12,000	227— 545
Smoke black (lampblack)	4,500— 6,000	4,500— 6,000	204— 272
Ivory black	3,000— 9,000	3,000— 9,000	136— 409
Brown oxide of iron	900— 1,500	900— 1,500	40— 68
Monaco lakes	30,000—35,000	30,000—35,000	1,363—1,590
Turkish lakes	8,000— 9,000	8,000— 9,000	363— 409

Mineral Colors

A strong reduction was noted in the orders of zinc white, lead white, red oxide of iron and iron minium, whereas with other mineral colors the demand was still very fair, and prices could even be increased in some cases, being maintained unchanged in others.

The following imports were noted during 1922: Natural colored earths 1,070 tons, artificial colored earths 267 tons, ultramarine 193 tons, unnamed mineral colors 739 tons, lampblack, sut black, 328 tons, ivory black, etc., 439 tons. The exports were as follows: Ultramarine 67½ tons, bone black 6½ tons, smoke or lampblack, etc., 41½ tons.

Table III shows the differences at the moment of writing in the lire quotations, in comparison with the prices prevailing on May 10, and the dollar values at the moment of writing.

Dyestuff Import Cases Heard and Pending in the General Appraiser's Court

From Special Bulletins of the Synthetic Organic Chemical Manufacturers' Association of the United States

Prepared by HARRISON F. WILMOT, Technical Adviser

THE following dyestuff cases have been tried before General Appraiser Brown, both sides having submitted evidence and testimony and rested. It is expected that decisions will be handed down some time during July or August of this year:

Indra Blue RSP Triple Powder (Kuttroff Pickhardt) vs. Ponsol Blue RP Paste (Du Pont).

This case involves the question of whether a domestic paste can be held to be competitive with an imported powder. It also involves a construction of the language of Paragraph 28 in so far as it states that the domestic article must produce substantially equal results when used in substantially the same manner.

Crystal Violet Extra (Kuttroff Pickhardt) vs. Crystal Violet TW (Butterworth-Judson) and Crystal Violet E (Du Pont).

This case involves the question of whether an imported dye which is used chiefly for paper can be held to be competitive with a domestic dye which will produce substantially equal results when used in dyeing different commodities, typewriter ribbons and carbon papers, cotton, wool, etc.

Dichlor-Sulpho-Phenyl-pyrazolon Carboxylic Acid (Sandoz Chemical Company) vs. Pyrazolon (Pharma Chemical Company).

This case involves a construction of the language of Paragraph F of Section 402 of the tariff act of 1922, wherein it states that it shall be the price "at which such article is freely offered for sale to all purchasers in the

principal market of the United States." This case will determine whether an offer without an acceptance is sufficient to create an American selling price.

Benzo Red 12B (Kuttroff Pickhardt) vs. Pontamine Fast Pink G (Du Pont).

This case involves the question of whether the definition of a competitive article in Paragraph F of Section 402 of the act of 1922 can be applied to an imported article between three and four times as strong as the domestic article, and whether the Government is entitled to take duty upon a value between three and four times that of the selling price of the domestic article.

Azo Flavine FFNX (Kuttroff Pickhardt) vs. Pontacyl Flavine FF (Du Pont), Azo Yellow A5W (National) and Indian Yellow GA (Grasselli).

The importers in this case have raised a question of whether the mere recitation by the importer of the fact that he knew of no competitive color sold in the United States was sufficient to shift the burden of proof to the Government. The importer in this case has questioned the constitutionality of Paragraph F of Section 402 of the tariff act of 1922, claiming that it is unconstitutional to tax one person's merchandise on the value of another person's merchandise.

Bromhydrate Homatropine (McKesson & Robbins) vs. Homatropine Hydrobromide (Merck & Co.).

This case raises the question of whether the provisions of Paragraphs 27 and 28 are sufficient to make a substance of vegetable origin competitive with a domestic coal-tar product.

Hydron Yellow NF Paste (H. A. Metz & Co.) vs. Anthrene Yellow G (Newport) and Ponsol Yellow G Du Pont).

Hydron Yellow NF Paste (Kuttroff Pickhardt) vs. Anthrene Yellow G (Newport) and Ponsol Yellow G (Du Pont).

These cases were tried with a view to having the court determine just how far two dyes may differ as to shade and relative properties and yet remain competitive under the definition of Paragraphs 27 and 28.

Cases Listed for September Docket

Kiton Fast Yellow 3G Conc. (Ciba Company) vs. Fast Light Yellow G3X (Pharma) and Fast Light Yellow 2G (Grasselli).

Zambesi Black D (Franklin I. & E. Co.) vs. Diazone Black DR (National).

Acid Milling Red G Conc. (Geigy Company) vs. Anthracene Red GLM (Garfield Aniline).

Kiton Pure Blue V Conc. (Ciba Company) vs. Alphazurine 2G (National).

Azure Blue (A. Hirst Company) vs. Azure Blue (T. L. Lavanburg Company) and Azure Blue (Paul Uhlich & Co.).

Methylparamidophenol (G. Gennert) vs. Monomethylparamidophenol Sulphate (American Aniline), Monomethylparamidophenol Sulphate (Zinsser æ Co.), and Monomethylparamidophenol Sulphate (Rhodia Chemical).

Anthracene Chromate Brown EB (Hensel Bruckman) vs. Anthracene Chrome Brown EB (New England Aniline).

Aspirin (Milton G. Lang & Co.) vs. Aspirin (Bayer Company of New York).

Ester 99 Per Cent (M. DeMattia) vs. Diethyl Phthalate (Van Dyk & Co.).

Ciba Blue 2 BD Paste (Ciba Company) vs. Ciba Blue 2BD Paste (Dow Chemical Company).

Ciba Blue 2B Powder (Ciba Company) vs. Ciba Blue 2B Powder (Dow Chemical Company).

Kiton Fast Yellow R Conc. (Ciba Company) vs. Pontacyl Light Yellow GG (Du Pont) and Fast Light Yellow GG (Pharma).

Thiazine Red RXX (Kuttroff Pickhardt) vs. Direct Pink 2B Conc. (Newport).

Chinoline Yellow KT Extra Conc. (Kuttroff Pickhardt) vs. Quinoline Yellow (National).

Indanthrene Blue 3G Double Paste (Ackerman Color) vs. Ponsol Blue 3G Paste (Du Pont).

Acid Violet 3BNO (Kuttroff Pickhardt) vs. Pontacyl Violet 4BL (Du Pont).

Indanthrene Blue RC Powder (Ackerman Color) vs. Anthrene Blue GCD (Newport).

Question of strength.

Indanthrene Violet RR Extra Paste (Wetterwald & Pfister) vs. Ponsol Violet RRD (Du Pont).

Question of strength.

Heliotropin (Morana, Inc.) vs. Heliotropin (Antoine Chiris).

Cinnamate Methyl (Geo. Lueders & Co.) vs. Cinnamate Methyl (Antoine Chiris).

Cinnamate Methyl (G. E. Dockendorff & Co.) vs. Cinnamate Methyl (Antoine Chiris).

Cinnamate Methyl (E. M. Lanning & Co.) vs. Cinnamate Methyl (Antoine Chiris).

Bromstyrol (G. E. Dockendorff & Co.) vs. Bromstyrol (Antoine Chiris).

Vanillin (E. M. Lanning & Co.) vs. Vanillin (Antoine Chiris).

Alcool (Phenylethylique) (Belgian Trading Company) vs. Phenylethylique (Dow Chemical Company).

Guaiacol Carbona (Morgenstern æ Co.) vs. Guaiacol Carbona (Du Pont).

IMPORTS OF DYES INTO SWATOW

The price of foreign dyes in Swatow in 1922 declined gradually and the importation of aniline dyes showed an increase in value of 22,051 haikwan taels ($18,247), as compared with the figures for the same quarter of last year, according to a memorandum prepared by the commissioner of customs in Swatow, describing the trade of this port for the quarter ending December 31, 1922. This increase, at the reduced valuation, represents a considerably larger increase in the quantity imported, due to the fact that the Chinese dyers now generally use foreign dyes instead of native.

1922 Dye Census, Nearly Ready, Shows Domestic Production Increased 66 Per Cent

THE United States Tariff Commission has just sent to press the annual "Census of Dyes and Other Synthetic Organic Chemicals" for the calendar year 1922. This report will be printed and ready for distribution during the present month. The report shows that during the year 1922 the domestic dye and organic chemical industry made notable progress. Many products were manufactured for the first time in this country and there were large increases in the quantity of production with conspicuous reductions in prices.

Production of Dyes Increases 66 Per Cent

The domestic production of dyes in 1922 by 87 firms was 64,632,187 pounds, an increase of 66 per cent over that of 1921. The sales for 1922 totaled 69,107,105 pounds valued at $41,463,790. The size of the industry in 1922 is in sharp contrast with that of 1914 when only seven firms manufactured a total of 6,619,729 pounds valued at $2,470,096. The dye industry in that period was in no sense a self-contained one, as the dyes produced were made almost entirely of intermediates imported chiefly from Germany. The increase in dye production during 1922 was largely due to an increase in general business activity. About June the textile and other dye-consuming industries became more active after the business depression and during the remaining months of the year the demand for dyes steadily increased.

Large Price Reductions

The average sales price of all domestic dyes for 1922 was 60 cents per pound compared with 83 cents in 1921 and $1.26 per pound in 1917. The 1922 figures represent a 28 per cent decline from that of 1921. There were price reductions for both the bulk colors and dyes consumed in smaller quantities. The average price of Indigo in 1921 was 45 cents per pound compared with 24 cents in 1922, a 47 per cent decrease. Direct Black EW declined 47 per cent, Acid Black 28 per cent, Salicine Black U 27 per cent, Alizarin 20 per cent, Alizarin Saphirol B 34 per cent, Wool Green S 41 per cent, Indanthrene Blue GCD 30 per cent, and Eosine 24 per cent.

Vat and Alizarin Dyes Show Large Increase

One of the conspicuous developments of the year 1922 was the increased production of vat and alizarin dyes. The vat dyes are used in cotton dyeing and printing for the production of shades of remarkable fastness which are not destroyed by the modern laundry treatment. These colors are of great complexity and have presented serious difficulties in their commercial production. Their use is on the increase, as the public is beginning to recognize that fast shades are obtainable on cotton goods. The alizarin dyes are of great value in wool dyeing and the addition to this field of new dyes and the increased production of other dyes is a significant step in the development of a self-contained dye industry. The total production of vat dyes (not including Indigo) was 1,075,992 pounds in 1922 compared with 345,152 pounds in 1921. The production of the anthraquinone dyes which includes alizarin dyes and a large part of the vat dyes, was 1,234,963 pounds.

Many New Dyes Produced

Many important dyes were produced for the first time on a commercial scale in 1922. These comprise colors of great value for the dyeing of either silk, cotton, or wool, such as vat dyes, alizarin, developed cotton dyes, mordant and acid dyes. The increased production of these colors is reflected in a reduction of these imports. The production of these dyes in the United States has resulted only after large expenditures on research and most painstaking investigations. There are still gaps in our manufacturing program which should be filled to make a self-contained dye industry. These comprise certain of the vat dyes, together with certain of the mordant, acid and direct dyes.

Quality and Standardization of American Dyes

The satisfactory quality and the uniform standardization of the American dyes is one of the striking evidences of the commendable progress made by the industry. Dye for dye, with relatively few exceptions, the domestic products are found equal to the pre-war German dyes. In the early stages of the domestic dye industry, after the outbreak of the Great War, many of our dyes were lacking in uniformity of strength and quality. This condition, however, no longer prevails as our domestic manufacturers are marketing dyes which are uniformly standardized as to strength and quality. Statements of the largest silk and woolen manufacturers and also from cotton printers and dyers agree as to the satisfactory results obtained from American dyes.

Production and Consumption

The United States produces about 93.5 per cent of the dyes actually consumed. The imports of dyes in 1922 totaled 3,982,631 pounds, the production was 64,632,187 pounds, and the exports totaled 6,956,593 pounds. Consumption is assumed to equal production, plus imports, minus exports, or 61,658,225 pounds. The imports in 1922 were 6.2 per cent of our total production and 6.5 per cent of our consumption. In 1914 the imports were nearly 90 per cent of our consumption.

general effect of slightly increasing the water resistance

Canvas treated with three commercial preparations free from pigments (Table III) showed marked deterioration in tensile strength and also low water resistance after six months' exposure.

TABLE III—*Water Resistance and Tensile Strength of Cotton Duck Treated with Three Commercial Waterproofing Preparations (Free from Pigments) and Exposed to the Weather for Six Months*

Treatment No.	Water Resistance After Exposure: Funnel Test Rating	Water Resistance After Exposure: Spray Test Rating	Tensile Strength After Exposure (1-In. Warp), Kg.	Variation from Strength of Untreated After Exposure, Per Cent	Tensile Strength of Unexposed Canvas, Kg.
Untreated	..	..	38	..	62
I	..	..	5	—87	60
II	..	6	8	—79	57
III	..	6	6	—84	57

All treatments recorded in Table II which permitted the canvas to show after exposure a tensile strength of at least 38 kg. (the strength of the untreated canvas after exposure) and a water-resistance rating of 9 or 10 by the funnel test are considered satisfactory for increasing the serviceability of cotton duck for outdoor uses. Since only such preparations as contained pigments come within this classification, it is probable that the treatments listed in Tables I and III would also be improved by the addition of the same pigments, and that, in general, the use of pigments in waterproofing treatments is beneficial.

When added to linseed-oil treatments, pigments have more or less of a stiffening effect, sometimes making the canvas too stiff for purposes which require folding. Zinc oxide had the greatest stiffening effect, and lampblack and aluminum bronzing powder probably had the least.

In commercial waterproofing preparations where there is a choice between light-colored or colorless and dark-colored varieties, the dark colors, such as buff or brown, will probably prove more durable.—Industry and Engineering Chemistry.

Foreign Dyes Imported Through the Port of New York During June

Including Synthetic Chemicals, Medicinals, Photographic Chemicals, Intermediates, and Other Coal-Tar Products Classified by the Tariff Act of 1922 Under Paragraphs 27 and 28

Compiled by the Chemical Division of the Bureau of Foreign and Domestic Commerce, in Collaboration with the Chemical Division of the United States Tariff Commission

THE imports of coal-tar dyes for June totaled 247,174 pounds, with an invoice value of $257,803. The following table shows the monthly imports through the port of New York for the year 1923:

Month	Pounds	Value
January*	179,309	$185,344
February	191,709	199,640
March	312,809	301,436
April	242,022	256,751
May	261,869	292,340

*Not complete.

The five dyes leading in quantity imported were Patent Blue, Indanthrene Brown R, Pyrogene Blue, Erio Blue AB and Ciba Violet B. Of the total quantity imported in June, 1923, 50 per cent came from Germany, 35 per cent from Switzerland, 10 per cent from Italy, 3 per cent from England and 2 per cent from Canada.

The imports of synthetic aromatic chemicals for June totaled 6,397 pounds, with an invoice value of $16,850. The imports of medicinals, photographic developers and other coal-tar chemicals for June totaled 216,538 pounds, with an invoice value of $30,292.

The dyes in this report are grouped by Schultz numbers, and in the case of those which could not be identified by Schultz number the classification according to ordinary method of application was adopted. As the pastes and powders of the vat dyes vary widely in strength and quantity, each vat dye has been reduced —in nearly every case—to a single-strength basis.

The designation "†" for competitive and "*" for non-competitive indicates the appraisement basis for the assessment of the ad valorem duty in paragraph 28 of the Tariff Act of 1922. Those dyes without designation are doubtful, pending further investigation.

The ad valorem rate for competitive dyes is based on the American selling price, as defined in sub-divi-

KEY TO ABBREVIATIONS FOR FOREIGN MANUFACTURERS

1—The Six Leading German Companies

A—Actien-Gesellschaft fur Anilin-Fabrikation, Berlin. Founded 1873. Branches in France and Russia.
B—Badische Anitin-und Soda-Fabrik, Ludwigshafen on the Rhine. Founded 1865. Branches in France and Russia.
By—Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen on the Rhine. Founded 1862. Branches in France and Russia.
C—Leopold Cassella & Co., Frankfort on the Main. Founded 1870. Branches in France and Russia.
K—Kalle & Co., A. G., Biebrich on the Rhine. Founded 1870. Branches in Russia.
M—Farbwerke vorm. Meister Lucius & Bruning, Hochst on the Main. Founded 1862. Branches in France and Russia.

2—The Seven Smaller German Companies

BK—Leipziger Anilinfabrik Beyer & Kegel, Furstenberg near Leipzig. Founded 1882.
GG—Chemikalienwerk Greishem G.m.b.H., Griesheim on the Main. Founded 1881.
CJ—Carl Jager G.m.b.H., Anilinfarbenfabrik, Dusseldorf. Founded 1823.
GrE—Chemische Fabrik Griesheim-Electron, Offenbach on the Main. Founded 1842.
L—Farbwerk Muhlheim vorm. A. Leonhardt & Co., Muhlheim on the Main. Founded 1879. Branch in France.
tM—Chemische Fabriken vorm. Weiler ter Meer, Uerdingen on the Rhine. Founded 1877.
WD—Wulfing, Dahl & Co., A. G. Barmen. Founded 1842.

3—Dutch, Belgian and French Companies

FA—Farbwerk Ammersfoort, Ammersfoort, Netherlands. Founded 1888.
NF—Niederlandische Farbe-und Chemikalienfabrik Delft, Netherlands (Delft). Founded 1897. Branch in Russia.
LG—Lazard Godchaux, of Brussels. (These products are probably compounded largely from the dyes made by A. Wiescher & Co., of Haeren, Belgium.)
P—Societe Anonyme des Matieres colorantes et produits chimiques St. Denis (formerly A. Poirrier), St. Denis, near Paris, France. Founded 1830.

4—Swiss Companies (all at Basel)

DH—Farbwerke vorm. L. Durand, Huguenin & Co. Founded 1871. Branches in Germany and France.
G—Aniiinfarben-und Extract-Fabriken vorm. Joh. Rud. Geigy. Founded 1764. Branches in France, Germany and Russia.
I—Geselfschaft fur chemische Industrie. Founded 1885. Branch in France.
S—Chemische Fabrik vorm. Sandoz & Co. Founded 1887.

5—English Companies

BAC—The British Alizarin Co., Ltd. Established 1882.
ClCo—The Clayton Aniline Co., Ltd., Clayton, near Manchester Founded 1876.
CR—Clauss & Co. (formerly Clauss & Ree), Clayton, near Manchester. Founded 1890.
CV—Colne Vale Chemical Co., Milnsbridge, near Huddersfield.
RHS—Read Holliday & Sons, Ltd., Huddersfield. Founded 1820. (Purchases by British Dyes, Ltd.)
BD—British Dyes, Ltd Founded 1915.
Lev—Levinstein, Ltd., Crumpsall Vale, near Manchester. Founded 1864.
Q—Importations of unknown source, through dealers in colors.

*NOTE—† denotes classification as competitive; * as non-competitive; absence of designation indicates decision pending.*

sion (f) of Section 402 of Title IV; the ad valorem rate for non-competitive dyes is based on the United States value as defined in sub-division (d) of Section 402 of Title IV of the Tariff Act of 1922.

Errata in Previous Reports

Due to a fault in mimeographing, two items in the April report failed to appear in certain copies; these were, however, included in the totals:

Under "Unidentified Vat Dyes":	
*Hydron Orange R Paste—(C)	110
Under "Unidentified Direct Dyes":	
Cotton Pink	400
Cotton Pink BX—(B)	
Cotton Pink GX—(B)	

The total for May should have been 261,869 pounds; value, $292,340.

The correct weight of Erio Cyanine imported in May, 1923, should have been reported as 19,092 pounds, instead of 1,992 pounds.

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
6	Martins Yellow	300
	*Aniline Yellow—(B)	
11	Chloramine Orange	4,188
	†Chloratine Fast Orange TL—(I)	
	Chlorantine Fast Brown RL—(I)	
19	Fast Light Yellow	2,120
	†Fast Light Yellow 3G—(By)	
34	Chrysoidine R	20
	†Chrysoidine RL Base—(B)	
48	Alizarine Yellow 2G	500
	†Alizarine Yellow 2G Paste—(M)	
81	Brilliant Cochineal	51
	Palatine Scarlet A—(B)	
88	Acid Anthracene Brown	2,759
	†Acid Anthracene Brown R—(By)	
	†Acid Anthracene Brown RH—(By)	
143	Tropaeoline	13
	†Yellow II—(B)	
159	Acid Alizarine Black	500
	*Acid Alizarine Black R—(M)	
168	Amaranth	300
	Amaranth B Conc.	
236	Wool Red	115
	*Fast Bordeaux B—(BK)	
260	Eriochrome Verdon	2,205
	*Eriochrome Verdon S—(G)	
265	Sulphon Cyanine Black	441
	*Acid Milling Black B—(G)	
273	Diaminogene Blue	2,115
	*Diaminogene Blue XA—(C)	
	*Diaminogene Blue XB—(C)	
274	Diaminogene	509
	*Diazo Indigo Blue BR Extra—(By)	
279	Benzo Fast Scarlet	4,790
	†Benzo Fast Scarlet 8BS—(By)	
	Direct Fast Scarlet SE—(I)	
288	Palatine Chrome Black	179
	†Acid Alizarine Black SE Pdr.—(M)	
296	Cotton Yellow	440
	†Diamine Fast Yellow 3G—(C)	
313	Congo Rubine	100
	*Congo Rubine—(A)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
319	Diamine Scarlet	1,000
	Diamine Scarlet 3B—(C)	
332	Benzo Fast Red	24
	†Benzo Fast Red 8BL—(By)	
342	Chrysamine	2,220
	Chrysamine KS—(S)	
358	Diphenyl Red	3,582
	*Acetopurpurine 8B—(A)	
	*Chloramine Red 8BS—(By)	
	*Toluylene Red—(GrE)	
364	Diazo Brilliant Black	60
	*Diazo Brilliant Black B—(By)	
370	Brilliant Congo	220
	*Brilliant Congo R—(By)	
373	Congo Orange	700
	*Congo Orange R—(A)	
392	Toluylene Orange	1,323
	*Direct Fast Orange K—(I)	
449	Trisulphon Brown	1,103
	*Diphenyl Brown TB Conc.—(G)	
456	Benzo Fast Blue	775
	*Benzo Fast Blue 2GL—(By)	
	*Benzo Fast Blue 4GL—(By)	
496	Setoglaucine	1,499
	*Setoglaucine 753—(G)	
503	Neptune Green	244
	†Brilliant Acid Green 6B—(By)	
506	Erioglaucine	1,331
	*Erioglaucine AB—(G)	
	*Erioglaucine AP—(G)	
523	Fast Green	2,562
	*Fast Green Extra Bluish—(By)	
528	Fast Acid Violet 10B	2,646
	Kiton Fast Violet 10B—(I)	
543	Patent Blue	12,696
	†Brilliant Acid Blue V—(By)	
	†Patent Blue V—(Q)	
	*Patent Marine Blue LE—(M)	
544	Cyanine B	440
	*Cyanine B—(M)	
545	Patent Blue A	946
	†Brilliant Acid Blue A—(By)	
546	Cyanol	1,951
	*Cyanol Extra—(C)	
	*Cyanol FF—(C)	
562	Fast Acid Blue	501
	Brilliant Wool Blue FFR Ex.—(By)	
571	Rhodamine 6G	1,167
	*Rhodamine 6G Extra—(By)	
	*Rhodamine 6GH—(I)	
	*Rhodamine 6GDX Extra—(B)	
	*Rhodamine 6GDX Extra—(Q)	
573	Rhodamine B	2,868
	†Rhodamine B Extra—(B)	
	†Rhodamine B Extra—(I)	
	†Rhodamine B Extra Base—(B)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
597	Rose Bengale	25
	†Rose Bengale B—(M)	
603	Acridine Orange	1,102
	*Acridine Orange DHE—(I)	
606	Phosphine	4,740
	*Coriophosphine OX Extra—(By)	
	Patent Phosphine G—(I)	
	Patent Phosphine R—(I)	
609	Homophosphine	200
	Flavophosphine G Conc.—(M)	
612	*Quinoline Yellow (spirit soluble)—(By)	100
613	Quinoline Yellow (water soluble)	50
	†Quinoline Yellow O—(Q)	
618	Thioflavine T	1,572
	*Tannoflavine T—(S)	
	*Thioflavine T—(C)	
	Rhoduline Yellow 6GT—(By)	
649	Cotton Blue	4
	†Cotton Blue R Extra—(B)	
667	Indochromine	201
	†Brilliant Alizarine Blue R Pdr.—(By)	
672	Azo Carmine	220
	*Azo Carmine GX—(B)	
681	New Fast Gray	1,102
	†Malta Gray J—(P)	
688	Rosolane	125
	*Rosolane Paste—(P)	
726	Pyrogene Blue	8,929
	Pyrogene Direct Blue RL—(I)	
747	Thional Brown	4,004
	*Tional Brown G—(S)	
748	Hydron Blue (single strength)	200
	‡Hydron Blue G—(C)	
	†Hydron Blue R—(C)	
759	Anthraflavone G Pst. (single strength)	3,804
	*Anthraflavone GC Paste—(B)	
	*Anthraflavone GC Powder—(B)	
760	Indan. Golden Orange G (sgle. stngth.)	3,102
	*Indan. Gldn. Orange G Dbl. Pst.—(B)	
	*Indan. Golden Orange G Pdr.—(B)	
761	Indan. Golden Orange R (sgle. stngth.)	536
	*Indan. Gldn. Orange RRT Pst.—(B)	
	*Indan. Gldn. Orange RRTS Pdr.—(B)	
767	Indan. Violet RR (single strength)	1,320
	†Indan. Violet RR Dbl. Pst.—(B)	
	†Indan. Violet RR Ex. Pdr.—(B)	
779	Alizarine Orange	3,142
	†Alizarine Orange AO—(BAC)	
	Alizarine Orange Powder—(M)	
780	Alizarine Red S	2,213
	*Alizarine Red S Powder—(B)	
	*Alizarine Red SX Extra Paste—(By)	
785	Alizarine GI, RG	2,179
	†Alizarine Red YCA—(BAC)	
	*Alizarine Red W Powder—(By)	
	*Alizarine Red IWS Powder—(M)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
788	Alizarine Cyanine R	440
	*Alizarine Cyanine NS Powder—(By)	
799	Alizarine Cyanine G	440
	*Alizarine Cyanine NSG Powder—(By)	
804	Alizarine Blue S	2,133
	*Alizarine Blue S Extra Paste—(By)	
808	Alizarine Green S Paste	1,358
	*Alizarine Green S Paste—(BAC)	
814	Algol Yellow WF (single strength)	634
	*Algol Yellow WF Powder—(By)	
819	Algol FF, R (single strength)	1,207
	*Algol Brilliant Red 2B Pdr.—(By)	
	*Algol Red FF Extra Paste—(By)	
820	Algol Brilliant Violet R (sgle. stngth.)	110
	*Algol Brilliant Violet R Paste—(By)	
821	Algol Brilliant Violet 2B (sgle. stngth.)	264
	*Indan. Bril. Violet BBK Pdr.—(B)	
827	Indan. Claret B Ex. (sgle. stngth.)	165
	*Indan. Claret B Ex. Pst.—(B)	
	*Anthrabordeaux B Powder—(B)	
830	Indanthrene Red R (single strength)	1,317
	*Indanthrene Red R Paste—(B)	
831	Indanthrene Red BN (single strength)	215
	*Indanthrene Red BN Ex. Pdr.—(B)	
	Indanthrene Red RK Paste—(B)	
833	Algol Olive R (single strength)	480
	*Algol Olive R Powder—(By)	
840	Indanthrene Blue 3G (sgle. stngth.)	2,200
	Indanthrene Blue 3G Powder—(B)	
842	Indanthrene Blue GCD (sgle. stngth)	5,615
	†Indanthrene Blue GCD Dbl. Pst.—(B)	
844	Algol Blue 3G (single strength)	88
	*Algol Blue 3G Powder—(By)	
852	Alizarine Irisol DR	42
	*Alizarine Irisol R Powder—(By)	
854	Alizarine Viridine	202
	*Alizarine Viridine FF Paste—(By)	
855	Alizarine Pure Blue	1,561
	*Alizarine Sky Blue Powder—(By)	
856	Alizarine Astrol	220
	*Alizarine Astrol B Powder—(By)	
858	Alizarine Saphirol B	4,677
	†Alizarine Light Blue B Conc.—(S)	
	†Alizarine Saphirol WSA Pdr.—(By)	
862	Alizarine Blue Black	6,692
	†Alizarine Blue Black B—(By)	
	†Alizarine Blue Black B—(Q)	
	†Alizarine Blue Black B Powder—(M)	
865	Alizarine Cyanine Green	2,113
	†Aliz. Cyanine Green G Ex. Pdr.—(By)	
870	Algol Corinth R (single strength)	399
	Vat Corinth RK Paste—(By)	
8992	Helindone Green G (single strength)	550
	*Helindone Green G Powder—(M)	
893	Alizarine Indigo G	441
901	Ciba Violet B (single strength)	7,055
	*Ciba Violet B Paste—(I)	
	*Ciba Violet R Double Paste—(I)	
902	Helindone Brown 2R (single strength)	375
	*Helindone Brown 2R Paste—(M)	
907	Ciba Scarlet	3,640
	*Ciba Scarlet G Extra Paste—(I)	
	*Thio Indigo Scarlet 2G Paste—(K)	
910	Helindone Pink	725
	Helindone Extra—(M)	
	Helindone Pink BN Paste—(M)	
911	Ciba Orange G	110
	Ciba Orange G Paste—(I)	
913	Helindone Orange R	1,100
	*Thioindigo Yellow 3GN Paste—(K)	
915	Helindone Fast Scarlet R (sgle. stngth.)	2,800
	*Helindone Fast Scarlet R Pdr.—(M)	
918	Helindone Red 3B	220
	*Thioindigo Red 3B Paste—(K)	
920	Helindone Violet (single strength)	550
	*Helindone Violet R Powder—(M)	

UNCLASSIFIED ACID DYES

Name of Dye and Manufacturer	Quantity (pounds)
Acid Milling Yellow G Conc.—(S)	2,002
†Acid Violet 4RNOO—(B)	22
Alizarine Cyanol Red B—(C)	2
*Alizarine Direct Violet ER Powder—(B)	55
Alizarine Rubinol	1,812
*Alizarine Rubinol 3G—(By)	
*Alizarine Rubinol GW Powder—(By)	
*Alizarine Rubinol R Powder—(By)	
*Brilliant Milling Blue B—(C)	610
*Cyananthrol RXO—(B)	110
Kiton Pure Blue AFL—(I)	441
Kiton Yellow G—(I)	331
*Onis 3B (Anthosine 3B)—(B)	110
*Onis 5B (Anthosine 5B)—(B)	55
Polar Yellow	1,543
*Polar Yellow 2G Conc.—(G)	
*Polar Yellow 5G Conc.—(G)	
*Supramine Black BR—(By)	99
*Supramine Brown R—(By)	148
Supramine Red	446
*Supramine Red B—(By)	
*Supramine Red 2G—(By)	
Supramine Yellow	409
Supramine Yellow G—(By)	
*Supramine Yellow R—(By)	
†Wool Black GRF—(A)	1,000
Wool Black for Printing N—(I)	441
Wool Printing Black CVT—(I)	441

UNCLASSIFIED BASIC DYES

Name of Dye and Manufacturer	Quantity (pounds)
*Basic Yellow T—(C)	2,000
Brilliant Acridine Orange A—(DH)	220
New Ethyl Blue BS—(M)	11
*Phosphine Orange—(G)	1,544

UNCLASSIFIED DIRECT DYES

Name of Dye and Manufacturer	Quantity (pounds)
†Benzo Fast Black L—(By)	110
*Benzo Fast Brown 3GL—(By)	252
Benzo Fast Heliotrope	260
*Benzo Fast Heliotrope 4BL—(By)	
*Benzo Fast Heliotrope 5RH—(By)	
†Benzo Light Brown 3GL—(By)	110
†Benzo Red 12B—(B)	1,110
*Brilliant Pure Yellow 6G Extra—(By)	55
†Benzo Scarlet BC—(By)	110
*Brilliant Benzo Violet B—(By)	440
*Brilliant Sky Blue 8G Extra—(Q)	1,060
Chlorantine Fast Brown 3GL—(I)	2,205
Chlorantine Fast Gray B—(I)	220
†Chlorantine Fast Orange TRL—(I)	2,205
Chlorantine Fast Violet 2R—(I)	1,102
Chlorantine Fast Yellow 4GL—(I)	331
Developing Blue 2R—(A)	500
*Diamine Brilliant Violet B—(C)	2,000
Diamine Fast Blue	2,220
†Diamine Fast Blue FFG—(C)	
*Diamine Fast Bordeaux 6BS—(C)	
Diamine Fast Brown	1,055
*Diamine Fast Brown GBB—(C)	
*Diamine Fast Brown 3G—(C)	
*Diamine Fast Brown R—(C)	
*Diamine Fast Orange ER—(C)	936
Diamine Fast Violet	220
*Diamine Fast Violet FFBN—(C)	
Diamine Fast Violet FFRN—(C)	
Diamine Orange	1,524
*Diamine Orange B—(C)	
Diamine Orange F—(C)	
*Diaminogen Sky Blue N—(C)	441
Dianil Fast Blue RL—(M)	110
†Dianil Fast Scarlet 4BSN—(M)	50
*Dianil Fast Violet BL—(M)	110
†Diazanil Black V—(M)	970
Diazanil Blue 2R—(M)	100
Diazanil Scarlet	2,417
*Diazanil Scarlet 3BA—(M)	
*Diazanil Scarlet 3BA Conc.—(M)	
*Diazanil Scarlet 4BA—(M)	
*Diazanil Scarlet 6BA—(M)	
*Diazo Brillant Green 3G—(By)	24
*Diazo Brilliant Orange 5G—(By)	100
Diazo Brilliant Scarlet	5,035
*Diazo Brilliant Scarlet B Extra—(By)	
*Diazo Brilliant Scarlet 3BA Extra—(By)	
Diazo Brilliant Scarlet 6B Extra—(By)	
*Diazo Brilliant Scarlet 5BL—(By)	
*Diazo Brilliant Scarlet G Extra—(By)	
Diazo Fast Blue 4RW—(I)	220
*Diazo Fast Yellow G—(By)	100
*Diazo Indigo Blue 4GL Extra—(By)	250
†Diazophenyl Black V—(G)	2,203
*Diazo Rubine B—(By)	1,251
*Diazo Sky Blue B—(By)	6,384
*Diazo Yellow R—(By)	100
*Direct Fast Orange K—(I)	882
†Eriochrome Flavine A Conc.—(G)	741
Nitranil Brown	330
Nitranil Brown B—(I)	
Nitranil Brown R—(I)	
Nitranil Brown S—(I)	
Nitranil Green B—(I)	110
*Pluto Brown 2G—(By)	100
*Plutoform Black BL—(By)	24

UNCLASSIFIED MORDANT AND CHROME DYES

Name of Dye and Manufacturer	Quantity (pounds)
*Acid Alizarine Gray G—(M)	2,432
*Alizarine Blue S Powder—(By)	330
*Alizarine Bordeaux 2G Paste—(By)	165
*Anthracene Blue SWB Powder—(B)	115
†Anthracene Chromate Brown EB—(C)	1,110
Brilliant Chromoxaine Blue G—(Q)	220
*Chromazone Red New Conc. 540—(G)	1,103
*Chrome Brown R—(G)	55
Chrome Violet	220
Chrome Violet CBD—(DH)	
*Chrome Violet CG—(DH)	
*Erio Blue AB—(G)	7,804
*Ianasol Brown 2R—(I)	441
*Milling Yellow 3G—(A)	100

UNCLASSIFIED VAT DYES

Name of Dye and Manufacturer	Quantity (pounds)
*Algol Brown G Paste—(Q)	220
*Anthra Pink B Extra Paste—(B)	55
Cibanone Brown R Paste—(I)	1,543
*Helindone Bordeaux B Extra Paste—(Q)	440
Helindone Golden Orange (single strength)	1,155
Helindone Golden Orange DJG Pdr.—(Q)	
*Helindone Golden Orange IG—(Q)	
*Helindone Golden Orange IRRT—(Q)	
*Helindone Gldn. Orange IRRT Pdr.—(M)	
*Heliotrope R (single strength)—(B)	44
*Helindone Pink R Extra Paste—(Q)	110
*Hydron Bordeaux B Double Paste—(C)	1,200
*Hydron Olive GN Paste—(C)	200
*Hydron Orange R Paste—(C)	610
Hydron Pink	6,528
*Hydron Pink FF Paste—(C)	
*Hydron Pink FB Paste—(Q)	
*Hydron Scarlet 2B (single strength)—(C)	3,628
†Indan. Blue BCS Powder (sgle. stngth.)—(B)	375
Indanthrene Brown R (single strength)	9,087
*Indanthrene Brown R Powder—(B)	
*Indanthrene Brown R Paste—(By)	
*Indan. Scarlet GS Powder (sgle. stngth.)—(Q)	2,032
*Indanthrene Violet BN Ex. Pst.—(Q)	110
*Thio Indigo Pink RN Extra Paste—(K)	445

UNCLASSIFIED SULPHUR DYES

Name of Dye and Manufacturer	Quantity (pounds)
Thiogene Violet V—(M)	100

UNCLASSIFIED COLOR LAKE DYES

Name of Dye and Manufacturer	Quantity (pounds)
Brilliant Lake Blue G Extra—(By)	127

UNIDENTIFIED, UNCLASSIFIED DYES

Name of Dye and Manufacturer	Quantity (pounds)
*Formal Fast Black G Conc.—(G)	110
*Fur Brown SO—(A)	150
*Japan Black Extra—(B)	220
All other aniline colors	60
*Radio Brown B Standard—(C)	200
*Radio Red G Standard—(C)	100

SYNTHETIC AROMATIC CHEMICALS OF COAL-TAR ORIGIN

Imported for Consumption During June, 1923

Name of Chemical	Quantity (pounds)
Amyl Salicylate	8
Acetate of Cyclohexanol	2 1/5
Anisaldehyde (Aubepine)	106
Benzyl Alcohol Extra	55
Benzyl Benzoate	677
Benzyl Acetate	220
Benbyl Proprionate	22
Beta Naphthol Methyl Ether (Yara Yara)	15
Coumarin	102
Ethyl Benzoate	7
Indol	2 1/5
Heliotropine	25
Methyl Acetophenone	10
Musk Ambrette	675
Musk Ambrette Residue	1,125
Musk Ketone	236
Musk Xylene	242
Methyl Anthranilate	275
Methyl Methyl Anthranilate	15
Para Cresol Isobutyl Ether	1
Methyl Para Cresol	4 1/2
Phenalic Ether	100
Phenyl Acetic Acid	295
Phenyl Acetaldehyde	774
Phenyl Ethyl Acetate	25
Phenyl Ethyl Alcohol	1,306
Phenyl Ethyl Butgrate	13
Phenyl Ethyl Formate	11
Phenyl Ethyl Propionate	15
Phenyl Propyl Alcohol	32
Phenyd Propyl Acetate	1/2

MEDICINAL, PHOTOGRAPHIC DEVELOPERS AND OTHER COAL-TAR CHEMICALS

Name of Chemical	Quantity (pounds)
Acid Phenyl Cinchoninicum	195
Sulphanilic Acid Anhydrous C.P. (grams)	2,050
Alizarine Sodium Sulfonate (grams)	100
Antipyrine	1,326
Amidopyrine	991
Benzoic Acid	100
Beta Methyl Anthraquinone	477
Cresylic Acid	188,630
Cresylic Acid (gallons)	434
Colchicine Salicylate (ounces)	5
Developer B	99
Developer Z	201
Dimethylaminoazobenzine	10
Duratol	79
Epinine	25 1/4
Epinine Hydrochloride	1
Eserine (ounces)	25
Quaiacol	1,102
Quaiacol Carbonate	903
Katanoil	2,205
Para Monochlorphenol (ounces)	8
Naphthol AS	17
Naphtylamine Acetate (ounces)	25
Nitrobenzzene	13,029
Para Nitrotoluene	8
Para Nitraniline (grams)	700
Phenyl Hydrazine Hydrochloride (grams)	1,025
Pilocarpine Salicylate (ounces)	10
Pyrazolon Phenyldimethyl	220
Resorcine Tech.	2,240
Rodinal	600
Rosaniline Hydrochloride (grams)	100
Rosaniline Sulfate (grams)	50
Sodium Salicylate	72
Theobromine and Sodium Benzoate	3
Tricresylphosphate	550

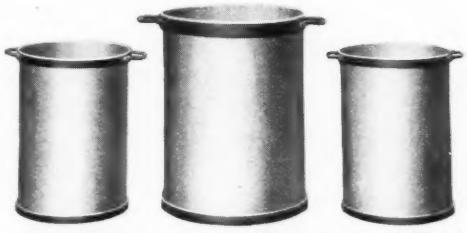
DYER FOR CANADA

A large American cotton manufacturing concern is looking for a man to take charge of dyeing and bleaching operations in its branch plant at Montreal, Canada. Address, giving qualifications, experience and salary expected, Box 229, care of the American Dyestuff Reporter.

DYESTUFF SALES-EXECUTIVE

An exceptionally well-informed dyestuff man with ten years' pre-war sales experience, continuously employed in responsible positions by both domestic and foreign concerns, would be glad to hear from dyestuff manufacturers or importers who have an opening for a high-class salesman or sales-executive. Address Box 228, care of the American Dyestuff Reporter

Transfer Cans
That Insure Against Staining



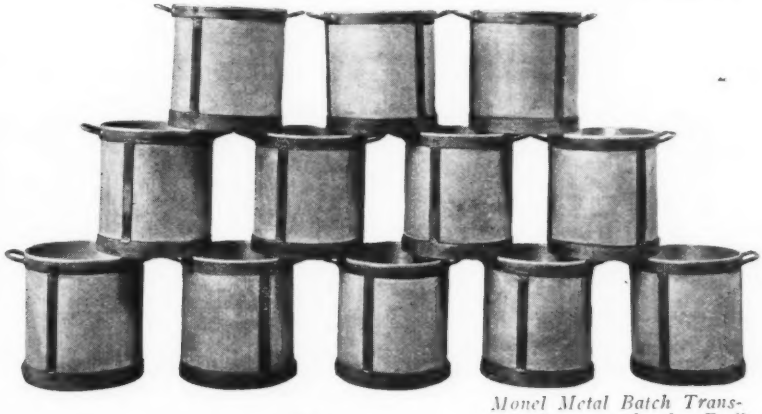
Three types of Batch Transfer Cans made by Sholes, Inc., New York City.

BECAUSE they cannot rust—because they resist attack by dye liquors and are so easily cleaned—because they have the requisite strength to carry heavy loads and withstand hard usage—

Batch Transfer Cans of Monel Metal are a paying investment for every dyehouse. They eliminate losses from spots or stains. They reduce cleaning time and cut down the number of cans required. And they last indefinitely.

Write for a copy of our Textile Bulletin, telling why Monel Metal is so extensively used for rotary dyeing machines, for tanks; in fact, for practically every metal part that may come into contact with dye liquor or fabric.

THE INTERNATIONAL NICKEL COMPANY
67 WALL ST. NEW YORK CITY



Monel Metal Batch Transfer Cans made by Emil Schaefer Co., Philadelphia, Pa.

INCo MOnel metal

RÖHM & HAAS CO.

Manufacturers of

CHEMICALS

40 North Front St., Philadelphia, Pa.

SPECIALTIES

LYKOPON—Concentrated Hydrosulphite for reducing Indigo and vat dyes.

FORMOPON—For discharge work.

FORMOPON EXTRA—For Stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

CHEMICALS

Sodium Sulphide, Sodium Bisulphite, Sulphate of Alumina, Acids, &c.

KLAUDER-WELDON

Dyeing-Bleaching-Scouring Machinery

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W Machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery by its accomplishments has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the **"world's best dyeing, bleaching and finishing machinery."**

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

The Klauder-Weldon Dyeing Machine Co.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent, Realty Bldg., Charlotte, N. C.

For *TEXTILE MILLS*

The Tide Water POWER GROUP

Straight mineral and compounded oils of viscosities best suited to meet the exacting requirements of textile mill lubrication.

Blanquol Loom Oils **Clarol Machinery Oils**
Suprol Cylinder Oils **Tycol Bearing Greases**
Dynol Engine and Turbine Oils

Tide Water Lubrication Staff

We have put on a scientific basis the selection of the proper lubricants for particular purposes by the creation of the Tide Water Lubrication Staff.

A Staff Engineer will be glad to visit your plant and supply you with a Lubrication Report on the more economical lubrication of *your machinery.*

A word from you will bring
him to your plant.

TIDE WATER OIL SALES CORPORATION
ELEVEN BROADWAY, NEW YORK

DIAX

Bleachers, Finishers and Dyers have complained that de-sizing compounds were expensive and hard to handle.

DIAX, made by the MALT-DIASTASE CO., brought down the price and made its use easy.

DIAX, because it is better, is being used with great success by the largest Bleachers, Finishers, Printers and Dyers

Write us for Free Demonstration and Sample

MALT-DIASTASE COMPANY

79 Wall St., New York City

——LABORATORIES——

58-64 Garden Street, Brooklyn, N. Y.
Wyckoff Avenue and Decatur Street, Evergreen, N. Y.

Established 1895

BOSSON & LANE

Manufacturers of

The Original

BLEACHING OIL

for boiling out Cotton, to produce a foundation for a Pure White

High Grade Sulphonated and Saponified

CASTOR OIL PRODUCTS

Para Soap Oil

Solvents and Assistants for cleaning all Textiles

B & L Bleachers' Bluings and Tints

Works and Office, ATLANTIC, MASS.

ZINSSER & CO.

Hastings-on-Hudson :: N. Y.

Alizarine

Black, Blue, Browns, Violet and Green

in Paste

for Calico Printers

in Powder

for Wool and Silk Dyers

Write for samples and information

Anthrole Oil

Used in the Dye Bath!

To eliminate harshness in the stock.

Assists in reducing waste on the cards.

Productive of brighter and faster shades in dyeing.

ARKANSAS CO., Inc.

253 Broadway

New York City

S. R. DAVID & COMPANY

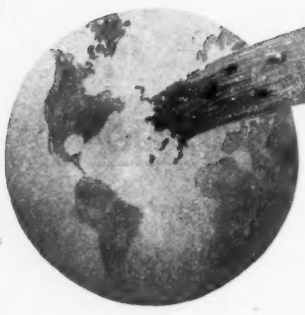
INCORPORATED

Dyestuffs

252 Congress Street, Boston, Mass.

Hartford Office: 1029 Main Street

Tel. Main 1684



Earth's Chemical Resources assembled for the Textile Industry

Although catering to the needs of all industries, our contact with the Textile Trade has been of the most intimate character for more than fifty years.

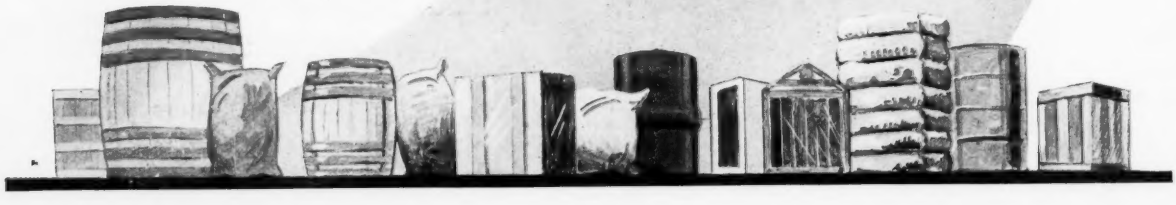
Collaboration of effort between the producers of fine fabrics, our technical field men and a complete laboratory research department, has served to develop a vast series of products and simplified processes for their scientific application to every phase of Textile Chemical treatment.

Our most active offerings are:

Paranitraniline	**Beta Naphthol**
Potato Flour	**Caustic Potash**
Bichromates	**Prussiates**
Formic Acid	**Dextrine**

Sizings—Softeners—Finishes

Dyestuffs and Colors
Sulphonated Oils
Turkey Red Oil

A. KLIPSTEIN & CO.

644-52 Greenwich St.
NEW YORK CITY
——BRANCHES——
Boston Philadelphia Chicago Providence, R. I. Charlotte, N. C.
Represented in Canada by
A. KLIPSTEIN & CO., LTD.
12 St. Peter St., Montreal